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Modelling Customer Satisfaction In Service Industries

Jonathan Keith Gorst

A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
for the degree of Doctor of Philosophy

July 2000

Abstract

Modelling Customer Satisfaction In Service Industries

This research considers a Customer Satisfaction Index approach and its relative benefits to the UK community. It is focussed on the service industries in both the public and private sectors. It looks at, and develops the measuring and modelling processes involved and employs a Structural Equation Modelling (SEM) methodology. The research critiques two of the leading methodologies currently available (Maximum Likelihood and Fixed Point Estimation) before selecting one from which to model the whole process.

Throughout the research, three different structural models are considered. These vary in how the different latent variables are connected together, but are based around a core of specific latent variables, which together make up a customer's total buying experience. Two of the models considered were by other authors, while the third (Sheffield Model) was a direct development of this research.

The data has been collected by the means of a questionnaire. Over the life of the research a generic questionnaire has been developed to produce a tool that is focused on the specific issues that the model requires for it to operate.

The final part of the research contemplates how a company can use the results of the index to pin point where improvements in their customer service provision would have the largest impact on their overall customer satisfaction index score.

The research considers the different aspects of customer satisfaction and their place within a Total Quality Management approach. However, the index is a completely self-contained product, which allows any company to measure how well it is satisfying its customers. The index calculates an index score between one and one hundred. The ultimate aim of the index is for a company's score to be compared over time, against other companies within the same industry, against other companies from other industries, against the national average and even against company's throughout Europe and the World, as National Indices operate overseas. In fact, it is envisaged that the index will act as a way for individual companies to benchmark themselves against the best customer service companies in the world.

It is hoped that over time the customer satisfaction index can become a key indicator as to the state of the UK economy. After all, satisfied customers are very often loyal customers, they tend to buy more, more often, and satisfied customers are often willing to pay premium prices for a company's products (Kristensen & Martensen, 1996).

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- The Survey & Statistical Research Centre, Sheffield Hallam University, in particularly Dorothy Biggin
- Everyone who took the time to complete one of the questionnaires

Preface

This thesis will take the reader through the research project, which looks at the area of modelling customer satisfaction. This preface acts as an overview to the entire thesis and will steer the reader quickly and easily through the different chapters.

Chapter 1 is the Introduction. It goes through the concept of quality and how this in turn leads to customer satisfaction as a measure of quality. The chapter then goes on to look at customer satisfactions place within an organisation and how it links in with an organisations current Total Quality Programme. The chapter concludes with a section, which looks at some alternative methods of measuring customer satisfaction and why these are not suitable for achieving Business Excellence.

Chapter 2 looks at the rationale and ramifications of using a customer satisfaction index. It outlines what is meant by the term 'customer satisfaction index', and what is also meant by the different 'dimensions' which form the index.

Chapter 3 covers the methodology. A number of different statistical methods have been used including Factor Analysis, Structural Equation Modelling (SEM) and general empirical studies. A critique of two different SEM methodologies has been included in this chapter along with justification using Partial Least Squares. In addition, a section is included which covers the process of developing the questionnaire.

Chapter 4 looks in detail at the results generated by three different structured models. The different models are compared with different data sets which were collected from both public and private service providers.

Chapter 5 provides an in-depth empirical study into the data collected from the South Yorkshire Police (SYP). Two surveys were carried out with SYP which looked at two different areas of their customer base, domestic and commercial users.

Chapter 6 is a case study looking at the customers of the Yorkshire Purchasing Organisation (YPO). The YPO is a public sector organisation that is jointly owned by a number of local authorities. However, it operates as a private company and actually makes a profit for its shareholders.

Chapter 7 is a another case study which assesses the opinions of delegates at the World Congress for Total Quality Management in 1998 and 1999.

Chapter 8 concludes the thesis by bringing all the points made throughout back together. The chapter also looks at using the model to identify where an organisation should concentrate its resources if it wants to increase its rating of customer satisfaction.

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Chapter 1 - Introduction

1.1 Concepts of Quality

An ever-increasing issue in business today, centres on the quality of services that an organisation is providing. Whether the firm is a high street store selling durable goods or a financial institution selling services, the satisfaction of the customer is increasingly of paramount importance. After all, satisfied customers and customer retention should be one of the highest priorities of any business enterprise (Kristensen & Martensen, 1996).

However, how can service be improved? How can a company ensure that its customers are satisfied? More importantly, how can a company ensure that its customers are satisfied enough to secure their return? Many books and journal articles address this subject. The likes of: Deming (1993), Juran (1989), Crosby (1979), Kanji (1990), Oakland (1993) and Zeithaml et al. (1990), to name but a few. These are people who have recognised the importance of good service and to a greater or lesser extent its place in Total Quality Management (TQM).

Increasingly important is the level of service provided by public sector organisations such as the police and local authorities. More and more public sector organisations have to account for the way in which they treat people. The government has introduced the Citizens Charter to highlight what it is reasonable to expect. However, this doesn't necessarily mean that a quality service will be forthcoming.

Quality is an important issue in the modern competitive business world (Dahlgaard et al., 1998). However, finding a definition that satisfies everyone for every situation is another matter and one that is not a practical solution anyway. Depending on the situation or context of a given product or service will effect the definition of quality. To this end Garvin (1984, 1988), Harvey and Green (1993), Dahlgaard et al. (1998) have suggested five discrete and interrelated definitions of quality.

They are:

- Exceptional
- Perfection
- Fitness for purpose
- Value for money
- Transformative

Further details of what is meant by each of these can be seen below.

- **Exceptional quality**

According to Dahlgaard et al. (1998), there are three variations of the exceptional concept. These are:

- Traditional - The elitist's view of high quality (Dahlgaard et al., 1998).
- Excellence - The best is required in order to achieve excellence (Dahlgaard et al., 1998).
- Standards - Quality is measured by the items which fulfil the minimum standards prescribed by the producer and can be described as 'conformance to standards' (Dahlgaard, et al., 1998).

- **Perfection**

Depending what a product or service is providing, perfection may be the aim. Indeed according to Crosby's (1979) 'Zero Defects' this is something that all workers should be striving towards.

- **Fitness for purpose**

This side of quality can be sometimes overlooked. While the perfect product or service is desirable, it also needs to be kept in mind whether or not the product or service will be able to carry out the purpose that it is intended for. A truck maybe the best in its class, economical, comfortable, low loading height etc., but if frozen chickens are the required product to be moved and the truck does not have a cold store facility, then it is not fit for purpose.

- **Value for money**

Using this definition, quality is described as the price you can afford to pay for your requirements at a reasonable cost, which means quality is compared with the level of specification and is directly related to cost (Dahlgaard, 1998). Therefore, in the purest sense the quality may not be that high, the screws might not all be tightened correctly, or it may not last as long as an alternative. However, in relation to the price that has been paid, it can be seen as being good value for money.

- **Transformative**

The transformative view of quality is that it is changing over time. What may be regarded as a high quality product one day may not be in subsequent years. An example of this can be seen in the printing industry. If we go back in time a number of years to the first printing presses, the quality of the print produced would be as good as was available at the time and better than anything that they had had in the past. However, as time moved on different techniques have

been developed which allow a better quality of print to be produced. Along with developments in the quality of paper production, over time the quality of books has increased but only at approximately the same rate as expectations.

For example, books that were classed as being good quality one hundred years ago would not necessarily be classed in the same category today due to people's expectations increasing.

Quality has different meanings for different people (Ishikawa (1976), Taguchi (1986), Deming (1982), Kano (1984), Scherkenback (1988), Juran and Gryan (1980)). However, taking the above explanations as a starting point for quality, will provide a base from which a more detailed explanation of measuring customer satisfaction, and the reasons behind why different aspects of customer satisfaction are measured. In '*Chapter 2 - Rationale and Ramifications of a Customer Satisfaction Index*', some of these aspects of quality will be further explained along with how they influence a customers satisfaction.

Besides these definitions of quality there are many more. It would seem that everyone who writes a book on the subject has his or her own particular definition. But what about quality to the customer? One way of attaining the customers' view of the quality of a product or service is through their satisfaction. Customer Satisfaction is one way of placing hard measures on the quality of a service, relevant to the customers needs and cost restrictions.

For managers to be able to see that service encounters are improving, it is necessary to find some way of measuring the satisfaction of customers, but where has customer satisfaction come from?

1.2 Development of customer satisfaction

Customer satisfaction has been around for a number of years. In the beginning it was probably in the guise of conscientious traders and merchants who had identified that a satisfied customer was likely to return for more of their goods.

In more recent times, Demings' approach of 'Total Quality Management' was a step towards ensuring quality from conception to the final sale of an item or service. Demings' has always treated the customer as being very important in fact Demings went as far as to say:

"The customer is the most important part of the production line. Without someone to purchase our product, we might as well shut down the whole plant."

The majority of Demings' work was in Japan and dealt mostly with the production of visible goods. This work was started about forty years ago, helping Japan to become the major economic player that it is today.

Following the second world war, NATO introduced a standard system to ensure that all member countries of the alliance produced standard quality products that could be used by any country. These standards proved to be useful to both suppliers and customers, and in the mid 1970's the British Standards Institute was lobbied to introduce a standard system for non-defence companies, which was not connected to the NATO system. The British Standards Institute's produced its first standards in 1979.

Following on from this, the International Standards Organisation took the 1979 version of BS5750 as the basis for its own quality standards, the ISO9000 series, which it published in 1982. In the ensuing years many companies have attained these standard levels, quoting the standard as a means of ensuring and acquiring continuing business. However, just because a company has been awarded ISO9000 or some other quality award, does not necessarily mean that it is producing a product or service that satisfies its customers. There have been instances when companies have gone into liquidation shortly after receiving an award, even the prestigious Baldrige Award, which is awarded in the United States.

Therefore, to ensure an organisation keeps functioning over time it needs to have in place a system for continually assessing what its customers think about it. However, before measurement techniques for customer satisfaction are discussed in more detail, it is worth mentioning that conceptually there are different types of customer satisfaction (Anderson et. al., 1994). At least two different conceptualisations of customer satisfaction can be distinguished:

- transaction specific customer satisfaction
- cumulative customer satisfaction

(Boulding et al. 1993)

An understanding of these two types of customer satisfaction will help with the understanding of the rest of this thesis.

- **Transaction specific customer satisfaction**

Transaction specific, is when each individual transaction is looked at on its own, with no regard for the level of service that has been experienced in the past. This could possibly be for transactions that are not used very often or are one off purchases. Therefore, customer satisfaction in these cases is viewed as a post-choice evaluative judgement of a specific

purchase occasion (Hunt, 1977)

However, the number of encounters that could be classified as solely transaction specific are very few. Purchasers that are one off, such as house buying are often from private individuals who are not concerned with whether the purchaser (customer) is satisfied or not. They are also making a one off sale and are not concerned with the individual returning.

There are many considerations that are taken into account when buying a house such as size and location, therefore, even if the house is being bought from new it does not follow that a customer will repurchase from a particular builder, just because they were satisfied with their previous home.

While customer satisfaction is still important, due to the fact that the customer can cause problems for the builder and carry out negative advertising through word of mouth, its importance is not the same as to the producer of an item that a customer will purchase a number of times.

- **Cumulative customer satisfaction**

This type of satisfaction is the one that this research is most concerned with. The idea that a previous interaction will effect the expectation the following time. To this extent it could possibly be argued that there is a link from customer loyalty to expectations. Therefore, cumulative customer satisfaction is an overall evaluation based on the total purchase and consumption experience with a good or service over time (Fornell, 1992; Johnson & Fornell, 1991).

Items that are not purchased that often such as white goods etc., while they may be seen by many as being transaction specific, are in fact part of a long-term cumulative effect. For example, the purchase of a washing machine occurs between every five and ten years. While this might be quite a length of time between purchasers, the manufacturer of the existing washing machine will hope that the existing customer will repurchase one of their products. The chances of repurchase come down to a number of different categories such as, reliability of existing machine, cost of replacement parts, efficiency of service team etc. It is therefore down to the manufacturer to ensure that all these different things are in place if they want to retain the customer.

The manufacturer needs to satisfy the customer over a long period of time, possibly up to ten years or more. Therefore, they must ensure that their product and services are of a high enough quality to retain a customer's loyalty.

If we assume that customer satisfaction is a cumulative effect, then its place in an organisation's strategy is also of great importance. Customer satisfaction will also be an influencing factor in a person's loyalty to a particular organisation.

1.3 Customer satisfaction and organisational strategy

If the quality gurus are correct, customer satisfaction is an integral part of TQM. Therefore, customer satisfaction is not enough on its own. It needs to be part of a quality process, from raw materials and people entering, to finished goods and services for the customer at the other end. By placing customer satisfaction as one step of a complete process brings about Kanji's definition of quality:

Quality - *"to satisfy customer's requirements continually."* (Kanji, 1990)

In fact this definition is part of Kanji's build up to TQM. He goes on to define Total Quality and Total Quality Management as follows:

Total Quality - *"is to achieve quality at a low cost."* (Kanji, 1990)

Total Quality Management - *"is to obtain total quality by involving everyone's daily commitment."* (Kanji, 1990)

'Customer Satisfaction', is a term used by many different companies and organisations. They use the term to describe the feelings that their customers have following an interaction with one of their members of staff, or, after using one of their products. Many organisations talk about improving customer satisfaction by many different and varied methods, but are these methodologies valid? The straight answer would probably be, if they result in an up turn in sales, particularly from customers returning to use the product or service again and again, then yes. However, these can often be short-term gains, but not, long term profits.

One other aspect that is facing companies today is that it is no longer sufficient to satisfy customers. It is becoming increasingly necessary to delight them (McNealy 1994, Donovan & Samler 1994, Plowman 1994). The argument being that a satisfied customer will only stay until a better offer comes along, whereas a delighted customer is more likely to remain loyal.

In this ever increasing competitive age, an organisation which is looking to be around for a long time, needs to have a strategy that is focused on the long term as well as the short. This means a strategy that not only concentrates on satisfying the customer at the end of the process, but also looks at the whole process, to see where improvements and cost savings can be made as an aim to increasing profit. Alternatively, in the case of a public sector organisation, providing service excellence for a reasonable cost.

A private sector organisation must make a profit, or shareholders will remove their money and the company will go bankrupt. A public sector organisation must work within budget, providing a service that is acceptable to its customers, otherwise customers will go elsewhere, if possible, or complain to the relevant authorities. Public Sector organisations that operate any way they see fit are becoming a thing of the past. If they don't measure up, there is always a private company willing to be given the chance to see if it can do better.

Therefore, if a company wants to look to the future and be able to keep on having high levels of customer satisfaction, or indeed wants to improve their level of customer satisfaction, a focused methodology for the whole organisation is required. One such holistic approach is, a 'Total Quality Management' (TQM) process.

In order to be able to understand customer satisfaction and how improvements and measurements can be made, it is first necessary to understand where it fits into the holistic approach of TQM. TQM is the way of life for an organisation committed to customer satisfaction through continuous improvement (Kanji & Asher, 1993).

1.4 Interface between Customer Satisfaction \ Total Quality Management \ Business Excellence

Customer Satisfaction is one small part of any business excellence process. Many different functions are placed together to create a complete business or organisation. However, customer satisfaction is an area that can be measured and gives an overall representation of how well or not so well an organisation is performing in the opinion of its customers. Therefore, customer satisfaction is described below as part of a Total Quality Management process.

1.4.1 Total Quality Management

Before TQM techniques can be introduced to an organisation, it is necessary to have a workforce and management structure that is willing and open to change. The culture that exists in the company is therefore of paramount importance, and it will more than likely be necessary to change the culture of the company before the way in which the organisation works can be changed. The concept of culture change and the move towards a quality culture has been discussed and written about by a number of different people, the likes of, Atkinson (1990), Brown (1995), Drennan (1992), Kennedy (1993), Kanji & Hiroshi (1997).

TQM comprises many different aspects which look to improve the company as a whole, from the time raw materials enter the factory to the time the finished product goes to the customer and beyond. It is becoming increasingly important for companies to provide after sales support, and important that the raw materials be of a certain standard to ensure a quality product. Therefore, if a company is receiving semi-finished goods to which it carries out a particular process, it might be necessary for its supplier to also have in place TQM principles. This will ensure that the product throughout its production is of a quality level that is as high as possible for the cost that has been incurred.

TQM has its roots going back to the end of the second world war. Japan was left devastated, and its industrialists realised that in order to rebuild their shattered industries, they would have to view quality as a prime ingredient (Kanji & Asher, 1993). They turned to America for help, which replied in the form of Dr Edward Deming and Dr Joseph Juran. These two men talked about the attributes of quality and its place in manufacturing at a time when American companies did not want to know.

Slowly the Japanese began to absorb the ideas that the two men talked about with the quality of their products increasing, until they caught up, and then, overtook their American and European counterparts.

Over the years that have followed, a number of different TQM gurus have emerged all with slightly different methodologies, but the same ultimate goal, to bring quality throughout the organisation. To build quality into a product as standard and not check and hope it is there following the completion of manufacture. Below is a list of some of the different exponents of TQM, and their methodologies:

Edward Deming:	The Deming Cycle
	Deming's Fourteen Points
	The Seven Deadly Diseases
Joseph Juran:	Juran's Three Basic Steps to Progress
	Juran's Ten Steps to Quality Improvement
	The Pareto Principle
	The Juran Trilogy
Philip Crosby:	Crosby's Quality Vaccine
	Crosby's Four Absolutes of Quality Management
	Crosby's Fourteen Steps to Quality Improvement
	Crosby's Four Absolutes of Leadership
Armand Feigenbaum:	Feigenbaum's Three Steps to Quality
	Feigenbaum's Four Deadly Sins
	Feigenbaum's Nineteen Steps to Quality Improvement
Genichi Taguchi:	The Loss Function
	Orthogonal Arrays and Linear Graphs
	Robustness
Gopal Kanji:	The Five Principles and The Eight Core Concepts
	The Kanji / Asher Quality Pyramid

While each have their own different concepts and principles to achieving total quality, there is also a large amount of overlap in their studies. As a means of explaining TQM in more detail, the work of Kanji & Asher will be used as a basis as their approach leads to a clear understanding of the place of customer satisfaction in TQM.

The Kanji & Asher work has been used as a basis for providing the TQM background as their approach contains a strong focus on customer satisfaction while portraying a strong emphasis on a structured approach as can be seen in their Pyramid Model (see figure 1.1). This work has been advanced further by the introduction of the Kanji (1998) Business Excellence Model, (see figure 1.4) which uses the same core concepts as the Pyramid Model, but in a more structured manner.

As an overall definition for TQM, Kanji's (1990) methodology will in general be adopted throughout the thesis, as it encompasses the concept of customer satisfaction as being a driving force for successful TQM implementation. Kanji's (1990) definition states: 'TQM is the way of life of an organisation committed to customer satisfaction through continuous improvement. This way of life varies from organisation to organisation and from one country to another but has certain essential principles which can be implemented to secure greater market share, increase profits and reduce cost'.

Kanji's Principles of TQM

Kanji & Asher (1993) break down TQM into five principles and eight concepts. Leadership forms the base upon which the four principles are built. The other four principles are:

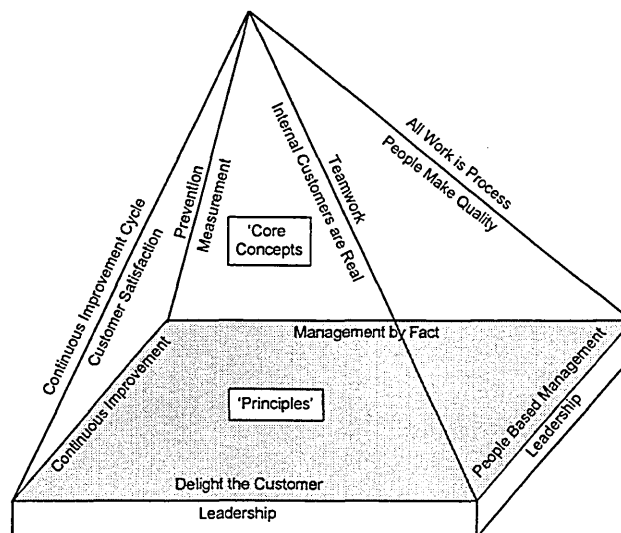
- Delight the customer
- Management by fact
- People based management
- Continuous Improvement

which, correspond with the following eight core concepts:

- Customer satisfaction
- Internal customers are real
- All work is a process
- Measurement
- Teamwork
- People make quality
- Continuous improvement cycle
- Prevention

By integrating these concepts and principles, Kanji & Asher have developed a model, the Quality Pyramid (see figure 1.1), to show off this relationship to the full.

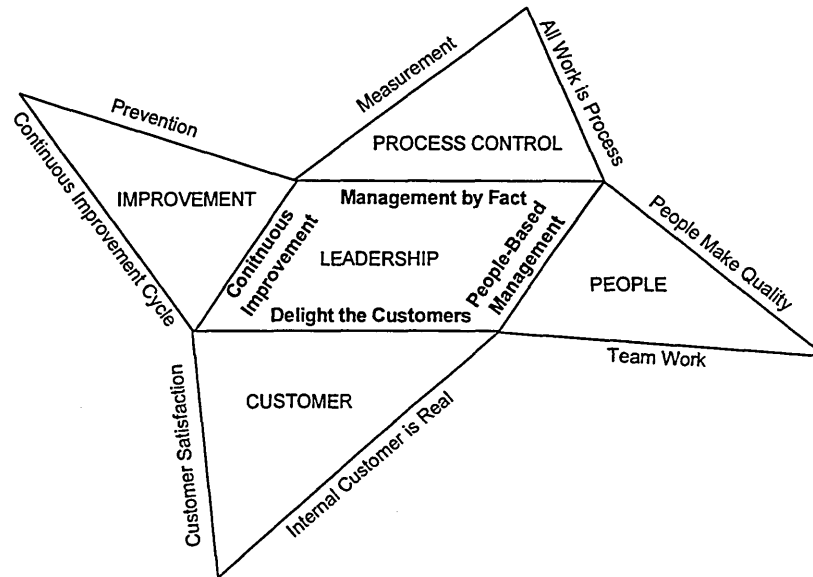
Figure 1.1 - The quality pyramid



Kanji & Asher's Quality Pyramid (1993)

If the pyramid is unfolded, (see figure 1.2), it can be seen that each of the principals has two related concepts.

Figure 1.2 - Unfolding the quality pyramid



Delight the Customer

Customer satisfaction - Internal customers are real

The idea of delighting customers rather than just satisfying them is a principal that many different quality authors employ (McNealy 1994, Donovan & Samler 1994, Plowman 1994). In delighting customers an organisation is often providing something that the customer had not expected or were not aware of the possibility of such a feature (Barnard & Wallace, 1994). Thus going a little bit further to ensure that the customer was happy with his purchase.

There is a concept that there are two types of customer satisfaction - Internal and External. External customer satisfaction is the one that most people can relate to. The idea is that a satisfied customer is more likely to return than one that is not. But what about the internal customer? If the concept of supply chains is understood and employed, then every employee within an organisation has a supplier and a customer. The fact that they all work for the same organisation is irrelevant. What is relevant is that they are all adding value to the product or service. It is important that they can all work together with each customer being satisfied if the desired end effect is a total quality company.

Management by Fact
All work is a process - Measurement

The two concepts that accompany 'Management by Fact' are 'measurement' and 'all work is a process'. Measurement is an important process, because without measurement you cannot tell whether improvements in efficiency are taking place or not. Measurement can take many different forms. The measuring of costs is one area where it is often seen as being critical if improvement in the whole company is to take place. By cutting costs, an organisation is likely to see an increase in profits. However, measuring costs is quite straight forward, as this is a 'hard measure'. Costs for materials, staff and other overheads are easy to see and record with the total being the addition of the different costs.

Other types of measurement are not so easy to achieve. Areas such as customer satisfaction are classed as being 'soft' measures, and are not so easy to put a single numeric value on. Many different things go to measure how satisfied a customer is, such as what was he expecting to happen? Were his expectations met, improved upon or missed entirely? What was the attitude of the staff member who served him? Several different things go into the satisfaction of a customer, many of which cannot be easily assigned a given number for future comparison.

'All work is a process', an obvious statement, but how many times is the significance of this missed? By identifying that every step of the process from raw materials to finished goods is some form of action, it can allow management and employees to see where cost savings and quality improvements can be made. By empowering shop floor workers to look at the processes that they carry out, and asking them to identify areas where improvements in manufacturing (or service) or cost savings can be made, can save an organisation a great deal of time and money while improving the quality of a particular product. Besides these is the added bonus that the employee will feel better about himself and the job that he is doing and bring about an improvement in employee loyalty.

People Based Management
Teamwork - People make quality

One, if not the most, valuable assets of any company is, or should be, its employees. An organisation is only as good as the people who work for it. It is by adding people to the product that customer service is created (Duffin, 1997). Therefore, it is the people that make or break a company. However, in many companies it is only the front line employees who actually deal directly with the customer, but these front line staff are only part of a team. That is not to say that the employees who do not deal directly with the external customer necessarily see any

relation between how they do their job and the external customer satisfaction. However, as Lon Wagner points out, as TQM moves through the work force, people are told and hopefully come to realise for themselves, that teamwork is the key to success. When employees start believing this and treat fellow workers as internal customers and suppliers, then there is a chance of success for the company.

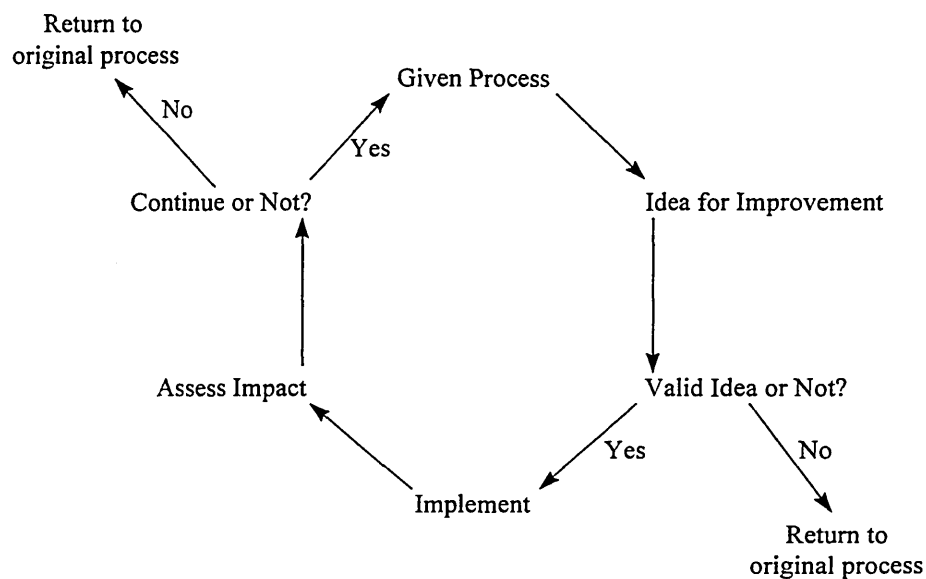
Continuous Improvement

Continuous improvement cycle - Prevention

Continuous Improvement, a watchword of TQM. In the changing times in which we live, it is important that a company at least keeps up with its competitors, if not leading them in the business that they are involved. The only way in which this can be achieved is to be continually aware and open to the fact that there are alternative ways of carrying out a given process.

Figure 1.3 shows that for any process a loop can be created to indicate the continuous improvement cycle:

Figure 1.3 - Continuous Improvement Cycle



The second concept of continuous improvement is prevention. One of a customers' biggest complaints with visible goods is a fault occurring which is due to either poor manufacture or design. Therefore, if these faults can be prevented from occurring, a more robust product will be produced with consequently fewer complaints due to the manufacture. The same can be said of services. If a service involves processes that are overly complicated, or is carried out by people who are not trained to cope with the complexity, then problems will arise. However, if the complexity is removed, or, staff are adequately trained, this will prevent the complaints or

dissatisfaction from occurring.

Preventing complaints is not enough. Dissatisfaction needs to be prevented, because as the TARP research has shown many people who are dissatisfied and have cause for complaint, don't challenge their supplier about it but instead take their business elsewhere.

Companies at the leading edge cannot afford to stand still. To stay ahead, the whole organisation must be involved in the constant drive for improvements in quality and service. Continuous improvement is a never-ending journey centred on the concept of starting each day anew with the principle that methods and performances can always be improved (IUKE, 1999).

Leadership

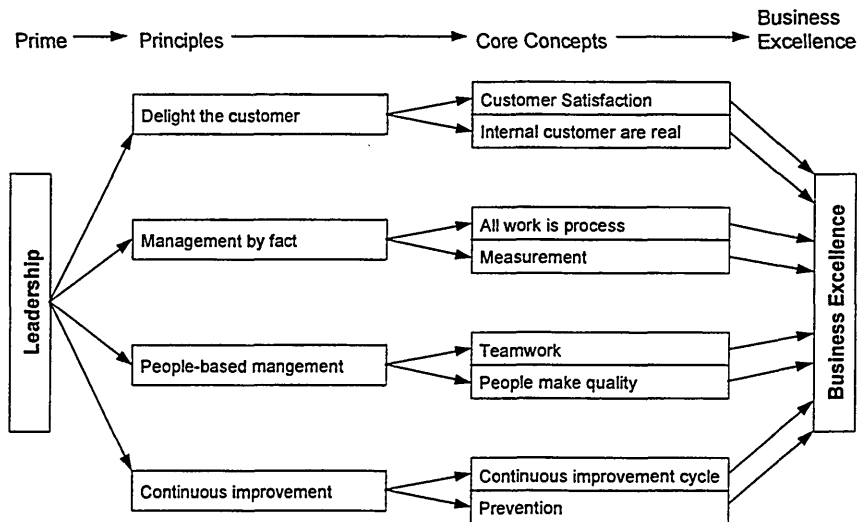
Leadership provides the base upon which the pyramid is built. Without good leadership and management being committed to the process, the chances for success are slim. TQM requires that employees work together as a team. The management of a particular organisation needs to be 100% behind TQM because in the early days especially, when resistance to change is at its strongest, the changes will need to be pushed through and enforced until the workforce comes around to thinking that change is good. Problems with the workforce can be very much dependant on the particular culture that exists in an organisation.

The challenge of leadership is to unite the whole company behind common aims and objectives and to steer the organisation through future change (IUKE, 1999).

One of the main driving forces in the modern business place is to provide Business Excellence as standard. However, how does a company know when it is providing Business Excellence? One such methodology that has been developed to measure just this is Kanji's (1998) Business Excellence Model.

1.4.2 Business Excellence

A further measure of how well an organisation is performing is Business Excellence. Kanji's approach to TQM is to achieve Business Excellence. The diagram in figure 1.4 is a re-arrangement of Kanji's (1990) pyramid model. It clearly shows that by starting with strong leadership and moving through the different principles and core concepts of TQM, an organisation will be able to move towards Business Excellence. According to Kanji's Business Excellence model, (see figure 1.4), there is a clear link from leadership to business excellence.

Figure 1.4 - Kanji's Business Excellence Model

Kanji (1998)

As can be seen in figure 1.4, customer satisfaction plays an important role in achieving business excellence.

This can be linked with the Business Excellence Model as created by the European Foundation for Quality Management (EFQM). Their model also uses customer satisfaction as a way of achieving business excellence. In fact, customer satisfaction is the largest proportion of the model.

However, while the Kanji approach uses a structured model, which indicates how the different dimensions influence each other and takes these influences into account when calculating a business excellence score, the EFQM methodology works differently.

The EFQM approach assigns weights to each of the different dimensions in advance rather than allowing the model to assign a weight as appropriate to the data. There are no linkages between any of the dimensions, thus stopping any of the elements from influencing any of the others. Therefore, the elements are discrete and independent of each other.

The EFQM Model is an 'indicating' model while Kanji's (1998) Business Excellence Model is an 'improving' model.

While Kanji's Business Excellence Model covers the area of customer satisfaction it does not go into any depth, nor does it consider the different aspects or dimensions that directly and indirectly influence customer satisfaction. Therefore an approach for directly measuring customer satisfaction is required. The next section looks at a number of different

methodologies, which claim to be measures of customer satisfaction.

1.5 Measuring Customer Satisfaction

A number of different techniques and methodologies exist for the measuring of customer satisfaction. Some are more widely accepted than others are. A number of the most used and written about can be seen below:

- SERVQUAL - Zeithaml et al., 1990
- SERVPERF - Cronin & Taylor, 1992
- SERVCON - Ruyter & Wetzels, 1996
- Priority Search - Priority Search Limited, Sheffield
- American Customer Satisfaction Index (ACSI) - Fornell, 1992

- **The SERVQUAL approach**

SERVQUAL is one of the most widely used methods employed for measuring, as its name suggests, SERVICE QUALITY. "SERVQUAL is a 22 item instrument for measuring customers' expectations and perceptions along five quality dimensions (tangibles, reliability, responsiveness, assurance and empathy)," (Zeithaml et al., 1990). Development began in 1983 and has been carried out by A. Parasuraman, Valarie A. Zeithaml and Leonard L. Berry. The aim of SERVQUAL is to indicate where the gaps occur between what customers expect and what they perceive. It was developed in order to provide, "a comprehensive conceptual foundation for understanding and improving service quality," (Zeithaml et al., 1990). It should be kept in mind that service quality can lead to customer satisfaction, but customer satisfaction does not lead to service quality. However, research carried out by Cronin & Taylor (1992) suggests, 'consumer satisfaction exerts a stronger influence on purchase intentions than does service quality'.

The SERVQUAL methodology can be split into two sections:

- I An expectations section. This is a survey containing 22 standard statements. These ascertain the general expectations of a customer concerning a given service.
- II A perceptions section. This is a survey containing a corresponding set of 22 statements. These are used to measure a customer's assessment of a particular company.

For example:

The expectations questionnaire will contain a question like the one below:

	Strongly Disagree					Strongly Agree	
1 Excellent banks will have modern looking equipment. etc.	1	2	3	4	5	6	7

While the perceptions questionnaire will include in the question the name of the specific company being surveyed.

	Strongly Disagree					Strongly Agree	
1 The XYZ Bank has modern looking equipment. etc.	1	2	3	4	5	6	7

The customer is asked to indicate how strongly they agree or disagree with the statement by the use of either a 5 or 7 point Likert scale with 1 being strongly disagree and 5 (7) being strongly agree.

These 22 statements cover the five dimensions of service quality. The five dimensions that were settled upon by Zeithaml et al, (1990) are:

Tangibles	Appearance of physical facilities, equipment, personnel, and communication materials.
Reliability	Ability to perform the promised service dependably and accurately.
Responsiveness	Willingness to help customers and provide prompt service.
Assurance	Knowledge and courtesy of employees and their ability to convey trust and confidence.
Empathy	Caring, individualised attention the firm provides its customers.

The respondent is then asked to complete a section, which assigns a total of one hundred points to the five dimensions. These provide a weighting, which is used in the final calculations. The SERVQUAL score is calculated by subtracting the expectation score from the perception score.

As might be expected, many articles have been written pertaining to the usefulness or not of the SERVQUAL methodology. Teas (1993, 1994) and Cronin & Taylor (1992, 1994) in particular, have written a number of papers condemning the validity of the technique, while Donnelly (1995, 1996) and Anderson (1995) have written papers which raise the different problems which can arise from implementing the method.

One other aspect to bear in mind is that SERVQUAL does not necessarily measure customer satisfaction. SERVQUAL measures service quality, which as stated above can lead to customer satisfaction. As Carlzon (1987) points out, 'while SERVQUAL tells managers how good its service is, it does not necessarily mean that customers are satisfied.'

- **The SERVPERF approach**

Cronin & Taylor (1992) developed the SERVPERF approach, SERVICE PERFORMANCE, as an alternative method to SERVQUAL. Cronin & Taylor (1992) indicate that little if any theoretical or empirical evidence supports the relevance of the expectations - performance gap as the basis for measuring service quality (Carman 1990). Therefore, with the support of other literature (cf. Bolton and Drew 1991 a,b; Churchill and Surprenant 1982; Mavis, Ahtola, and Kippel 1975; Woodruff, Cadotte, and Jenkins 1983) they developed SERVPERF as an alternative to the SERVQUAL measure. Cronin & Taylor are two of the biggest critics of the SERVQUAL methodology

As the basis for the SERVPERF model Cronin & Taylor (1992), use the same 22 item performance indicators as used by SERVQUAL, but only from the perceived side.

- **The SERVCON approach**

SERVCON was also developed as an adaptation of SERVQUAL, whereby conjoint analysis was integrated with the SERVQUAL methodology (Ruyter & Wetzels, 1996). This approach does not seem to have met with any great success as journal articles regarding its successful application are not available.

- **The Priority Search approach**

The Priority Search technique has been developed and is used by Priority Search Ltd., a Sheffield based company.

The algorithm that powers the Priority Search paired comparison section is based heavily on George Kelly's development of the Personal Construct Theory.

Kelly's theory concentrated in the main on work with individuals. A repertory grid was drawn up from constructs, i.e. statements which had meaning to an individual about an issue of importance to her / him. Followers of Kelly, for example Bannister and Fransella, used principal component analysis to facilitate interpretation of the data.

Priority Search uses sequential paired comparison to facilitate the task of pairing constructs. This method was first described by Shapiro in 1961 and later developed by Phillips in 1963. Priority Search is a further development of this methodology to permit a rapid and accurate estimation of people's priorities.

The technique places in sequence (from the most important to the least) the different issues that have been asked of a given population. Ideally, these issues would be given to each respondent, with the intention that each respondent places them in the order that they find significant (from the most important to the least). However, the longer the list of items becomes the more difficult the human brain finds it to compare all items against each other simultaneously. It is just not possible for the majority of people to be able to remember all the issues and then rank them in order.

The next stage in this thinking was then to compare each issue with every other issue. This would, by the use of an algorithm, be able to produce a ranked order for the issues, or a priority list. However, while this approach is fairly robust, it has the effect of making very large questionnaires. For example, if the user wanted the respondent to rank 22 different items, that would mean a total of 231 different pairs, clearly unacceptable in terms of length.

The approach that Priority Search has adopted is to compare each issue with three others. Therefore, if the same 22 issues are required in a rank order, the paired comparison section would contain 33 different pairs. While this cuts down on the size of the questionnaire, it is possible for a relatively unimportant item to be paired with three items that are important. This can have the effect of lowering the item by a number of points in the priority list. However, the Priority Search literature indicates that whilst this is always a possibility it will never seriously influence the results since a complete picture is being considered rather than the precise positions of individual items.

The pairing is pseudo random.

While the Priority Search Technique is useful for identifying which issues customers see as being important, it is of little benefit for measuring customer satisfaction over time. In fact, for the Priority Search technique to be of any value at all it is important that the issues included for comparison are in fact relevant to the organisation. To do this requires the use of focus groups, which can be very time consuming. Added to the time constraints that this imposes, the additional problems of the necessity for focus groups to be fairly small so as to be manageable,

also brings about the added problem of whether or not they are representative of an organisations customers. Even following a representative focus group the onus is still on the organisation to ensure that the correct issues are chosen from the ones that have been generated by the focus group.

The Priority Search methodology is a fairly long and drawn out process which has many opportunities for an organisations subjectivity to get in the way of an independent objective study.

Over time the Priority Search method can be repeated, and comparisons made to see whether or not a change has been made in the customers priorities. However, this is not a true measure of customer satisfaction, and the value of the study in consecutive years is not likely to compare to the value obtained in the first. Another problem that occurs with the methodology is the easiness with which unexpected results are explained.

Therefore, for comparisons over time a different approach is required. An approach, which actually measures customer satisfaction and its corresponding dimensions.

As the titles of both SERVQUAL (service quality) and SERVPERF (service performance) suggest, they do not measure customer satisfaction, but instead measure the quality of the service that is being provided. The difference between customer satisfaction and service quality is quite distinct. Only the customer can measure the level of customer satisfaction. An organisation might have its own perception of the level, but the customer is the only real judge. Whereas the level of service quality is defined by the organisation in terms of the amount of time, effort and resources it is willing to put into it.

A customer satisfaction index is a way of measuring an organisations customers perceptions as to the level of satisfaction that they are receiving. It is also has the added benefits of being easily comparable over time.

1.6 Conclusion

Of the four different methods mentioned none of them directly measure customer satisfaction and produce results that are easily understood by the man on the street. The SERVQUAL methodology is quite long and complex. It is widely used with a large number of articles relating to its successful implementation. However, on closer inspection of these articles it would seem that 'pure' SERVQUAL has not been implemented, but instead a variation of SERVQUAL has been used which fits the particular individual or organisations needs at the time.

The literature surrounding the SERVPERF measure is substantive and makes a strong case for using it as opposed to the SERVQUAL methodology it comes from. However, much of the debate is very theoretical and articles about its successful empirical implementation are not as common as for SERVQUAL.

The Priority Search Methodology does not measure customer satisfaction. It takes a number of issues that have an effect on an organisation and ranks them. This in itself can be a useful exercise for an organisation wishing to know which areas it should concentrate on improving. However, if at the present time an issue is being dealt with satisfactorily, the issue will come out as been lower down the list than it actually should be. If the organisation then looks at the list and puts more resources into issues at the top of the list while removing resources from issues lower down the list, the chances are that customers will find a decrease in particular services which before the survey were adequate.

Almost any variation away from what was expected can be explained, thus removing any objectivity from the study. The approach is too qualitative in its final explanations, when quantitative unequivocal explanations are required.

Chapter 2 -
Rationale and Ramifications of a Customer Satisfaction
Index in the Public \ Private Sector

2.1 Introduction - The Public and Private Sector

Throughout this research project reference has been made to both the public and private sector. A brief description of each can be seen below:

- **The Public Sector**

The public sector is the area of the economy that is run by the state, whether it is local, national or European. For the purposes of this research, two studies were conducted in the public sector; these were both carried out in conjunction with South Yorkshire Police, with two different sets of their customers. More information can be found on this work in '*Chapter 5 – An Empirical Study of the Public Sector Data*'.

- **The Private Sector**

The Private Sector is the area of the economy, which comprises companies. These are organisations, which in general have to make a profit or at least break even if they are to survive in the long term. During this research project two private sector case studies were undertaken. These looked at the customer satisfaction of the delegates at the third and fourth World Congresses for Total Quality Management. The details of these studies can be found in '*Chapter 7 - Private Sector Case Studies*'.

- **The Public \ Private Sector**

For the purposes of this research, the Yorkshire Purchasing Organisation (YPO) study has been classified as being an organisation, which is both public and private. Technically speaking the YPO is a public organisation because it is owned by a number of different local authorities. However, the organisation operates like a privately owned company and makes a profit for its shareholders. The customers of the organisation are also free to go elsewhere for their products if they so wish. The details of this study can be found in '*Chapter 6 - Public \ Private Sector Case Study*'.

Differences \ Similarities of Public \ Private Sectors

There are a number of differences and similarities between the public and private sectors. The aim of all organisations operating in both sectors should be to satisfy their customers. However, the driving force behind why they want to satisfy their customers can be quite different. In the private sector a company aims to satisfy its customers in the hope that they will return to buy more products or services. That their customers will tell their friends and associates about them who in turn will buy products or services from them. If a person is not loyal to a particular company, they will spend their money elsewhere. The cost of finding new customers is far more expensive than retaining old ones (Reichheld, 1996). In fact, studies by Naumann & Giel (1995) show that it costs about five times as much time, money and resources to obtain a new customer as it does to retain an existing one.

In the public sector the emphasis is different. It is often the case that people do not have any choice in where they purchase a particular service. In the case of the police, there is no other company or organisation that supplies the full range of services. Therefore, the driving force behind the police to make them want to excel is different. Loyalty to the police takes a different form as loyalty to a private sector company. The question can even be asked, 'Are the police interested in having loyal customers?' The answer must be yes. While loyalty to the police is different, it is also important that it does not become a negative.

If people have low loyalty towards the police, or a lack of trust in the police, then problems start to occur. Minor disturbances can turn into major incidents. Crimes will go un-reported, therefore distorting the true nature of the state of the country. Therefore, loyalty to the police is an important area for measurement, although it is not an easy feat to accomplish.

2.2 A Customer Satisfaction Index

What is a Customer Satisfaction Index?

A customer satisfaction index is a way of benchmarking customer's perceptions of an organisation over time. At a basic level, following a survey, and statistical calculations, it awards an organisation a score between one and a hundred. The organisation is monitored over time with a new score being calculated every six or twelve months, or whatever is appropriate. The score allows the organisation to look at itself to see whether or not in terms of customer satisfaction it is improving, disproving or remaining fairly static. However, because the methodology is constant across industries, sectors and nationally, it allows comparisons between other organisations whether they are in the same field of operation or not.

Figure 2.1 - How an organisation fairs over time

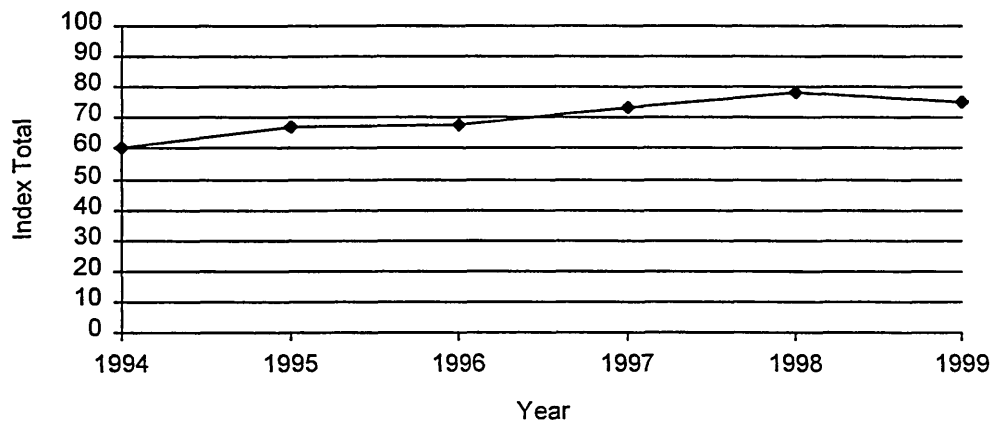


Figure 2.1, shows how an organisation's customer satisfaction index might have varied over the previous six years. As can be seen, it is possible for an organisation's manager and directors to look at the chart and see at a glance whether or not their customers perceive them as improving or disproving over time.

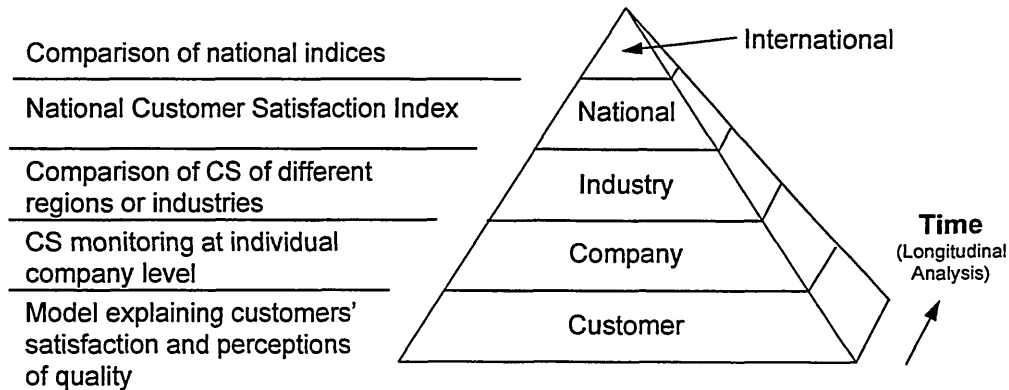
The purpose of an effective customer satisfaction index instrument is to provide a framework which allows an organisation to determine customer expectations and monitor how successfully a number of prioritised factors are being met over time. It should be able to track customer satisfaction in the areas that are most important to different types of customers.

One successful such index is the one developed by Fornell (1992) and his team, and is currently running over most of the economy in Sweden and America.

Positioning the Index

One of the benefits of the index approach that has been developed initially in Sweden and America and then subsequently in the U.K., is that it can be positioned at more than one place in the economy as figure 2.2 shows.

Figure 2.2 - Positioning the Index



Hackl et al., 1996

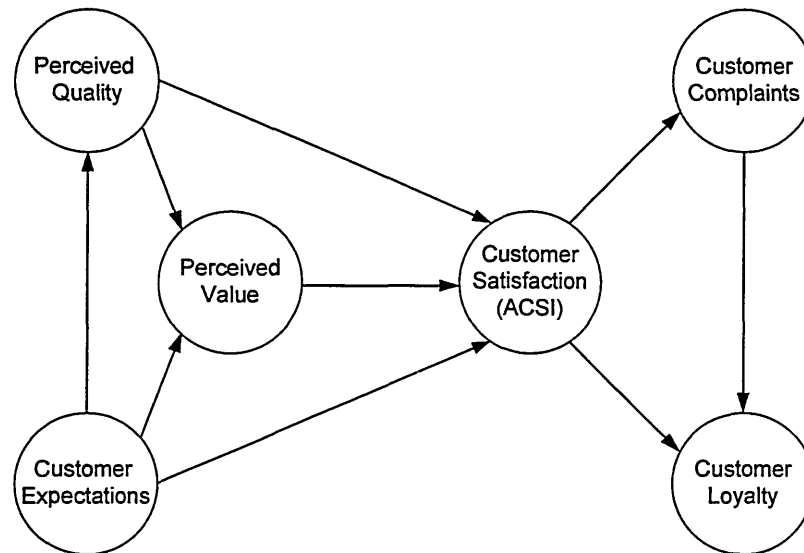
The data collection methodology can handle both, company-to-customer, or, company-to-company type surveys. Besides carrying out company-to-company surveys, it is also possible to direct the questionnaires at particular levels of a company thus ensuring that the different perspectives of an organisation's customers, are measured.

Therefore, a company's position in the supply chain does not stop it from receiving a Customer Satisfaction Index score.

The Swedish Customer Satisfaction Barometer (SCSB)

The SCSB and its American counter-part, the American Customer Satisfaction Index (ACSI), are economic indicators that measure customer satisfaction. In the SCSB, customer's evaluations of quality are based on actual experiences with the goods and services being measured. These goods and services have been purchased in Sweden and produced by both domestic and foreign firms that have substantial market share.

The model that has been developed, measures and takes into account a number of different areas which are analysed using the Partial Least Squares (PLS) methodology. The model can be seen in figure 2.3.

Figure 2.3 - The Swedish Customer Satisfaction Barometer Model

Fornell (1992)

As can be seen from the model (figure 2.3), more than customer satisfaction is measured. By measuring a number of different areas the aim is that the different items that effect customer satisfaction will also be measured and their influence can then be taken into account when calculating the index.

The SCSB carries out its research by using a specially written and developed questionnaire. Completion is carried out by telephone interviews. The questionnaire is asked of customers who have had a recent interaction with a particular company or organisation. Following analysis of the results an index score is produced which will lie between zero and one hundred, with zero being the lowest and one hundred the highest possible score.

The index concentrates exclusively on companies and public sector agencies that supply nationally to household customers, and subscribe to the system.

The Benefits of Using an Index Approach

By using a barometer approach, each organisation (which subscribes), industry, economic sector and the country as a whole, is awarded an index total each year. As the years go by it is possible to track whether a particular company's customer satisfaction rating has improved or decreased over time. Likewise, for the industry, economic sector and country indices. Therefore, by using an index approach, it is similar to having a benchmark year, after which each subsequent years index total can be compared against.

A benefit of the index is that it allows companies to compare themselves against the different companies who they are competing against, to see which company is providing the best customer satisfaction. This is of particular benefit to companies who are not doing as well as they possibly could, as it will give them an incentive to do something about their failings. Besides being able to compare companies within the same industry, because the index is a single number and is surveyed and calculated using a generic model, it is possible to compare across industries and economic sectors. It is even possible for companies to compare how well they are doing against the national total.

The SCSB acts as a means for consumers to see which companies provide good service before they shop.

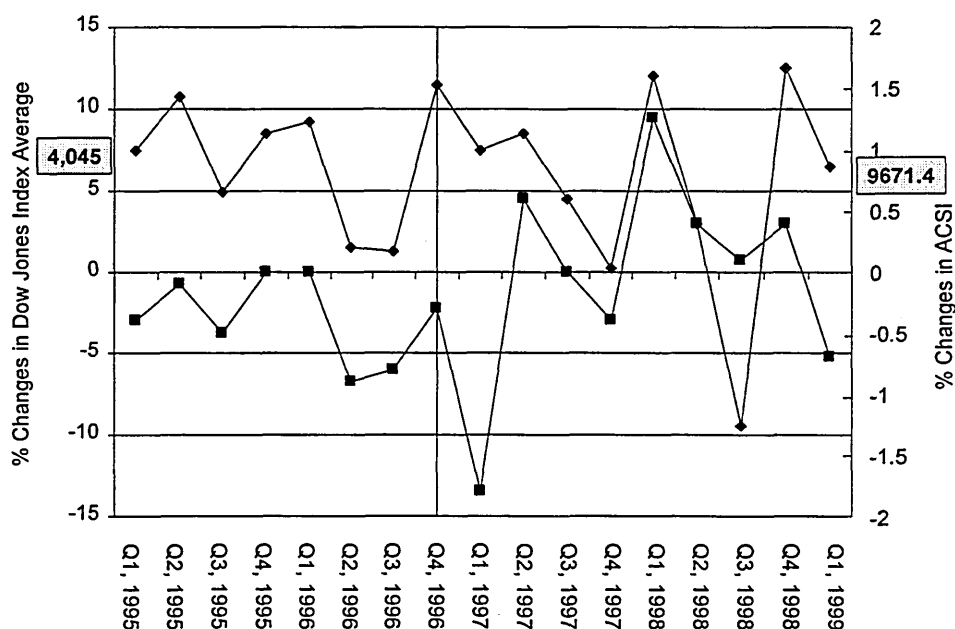
"The Index has the potential to raise the public's perception and understanding of quality, much in the same way the public has become aware of the consumer price index and other macroeconomic indicators."

Jack West, Chairman, American Society for Quality Control

Economic Benefits of measuring customer satisfaction

Over the past few years a number of people have attempted to show that through improving customer satisfaction, improvements to profitability can be achieved (Anderson et al., 1994).

Figure 2.4 - ACSI and Dow Jones percentage changes



(Fornell, 1999)

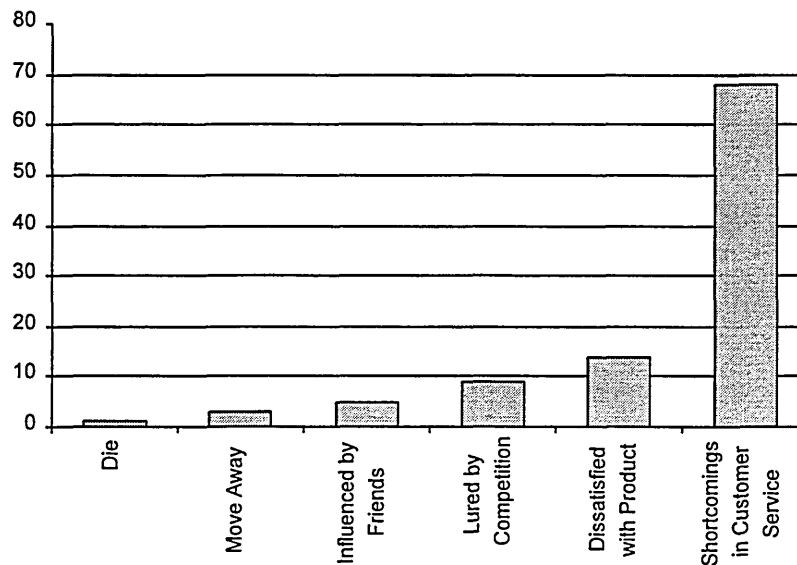
As the graph in figure 2.4 shows, there is a definite link between the American Customer Satisfaction Index and the Dow Jones Index. The relative quarterly changes in ACSI and in the Dow Jones Index seem to be closely linked in through out 1995 and 1996, with a one-quarter lead for ACSI, but eventually these seem to happen concurrently (Eklöf et. al., 1999). Eklöf et. al. (1999) then go on to explain that is probably due to the increasing awareness of, and focus on, ACSI as an important source of information to evaluate the stock market.

Reasons for measuring customer satisfaction

By tracking customer satisfaction over time, it is possible to work on the long-term goal of creating loyal customers. It has been shown that satisfied customers are very often loyal customers, they tend to buy more, more often, and satisfied customers are often willing to pay premium prices for the company's products (Kristensen & Martensen, 1996).

By considering why organisations lose customers can also bring home the benefits of measuring customer satisfaction with the long-term aim of retaining existing customers. In research carried out by McNealy (1994), he discusses why organisations lose customers. By far the biggest reason for customers moving away was 'shortcomings in customer service', (68%). The graph in figure 2.5 shows the reasons why organisations lose customers.

Figure 2.5 - Why organisations lose customers

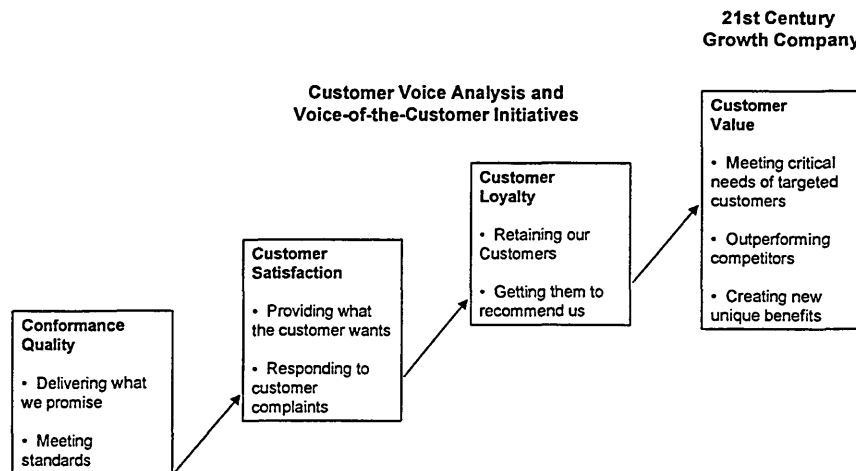


McNealy, 1994

Long term aims of monitoring customer satisfaction

There should be an ultimate aim in monitoring an organisations level of customer satisfaction. Again in striving for the ultimate aim, there are different stages to go through and different organisations will be at different stages of the journey. Figure 2.6 shows one possible journey that an organisation might choose to follow.

Figure 2.6 - Trends in customer satisfacton, loyalty and value



Strategic Insights (1998)

While an organisation might classify themselves as being at one particular point on this journey, it is also worth pointing out that a company can also slip backwards down this diagram if the management of the organisation is not providing what the customer wants. In essence, although an organisation might feel that it is moving to the next stage, it is still important to keep doing the things that moved it to that stage. For example, it is no good concentrating on retaining customers, if the organisation has stopped delivering what it has promised.

2.3 The Dimensions

The rest of this chapter looks at each dimension individually and looks at the different things that each dimension incorporates. The different dimensions that have been included in the research are:

- Perceived Expectations
- Perceived Quality (General)
- Perceived Quality (Hardware)
- Perceived Quality (Humanware)
- Perceived Image
- Perceived Value
- Complaints
- Customer Satisfaction
- Loyalty

Complaints is included here as it is part of the original Swedish Customer Satisfaction Barometer (SCSB), however, as the model was developed for Europe and the U.K., it was removed (see '*Chapter 3 – Methodology, A Customer Satisfaction Index*', for more details). Likewise, the dimension of Quality was split into two different parts as the model developed and the dimension of Image has been added with the advent of the European Model.

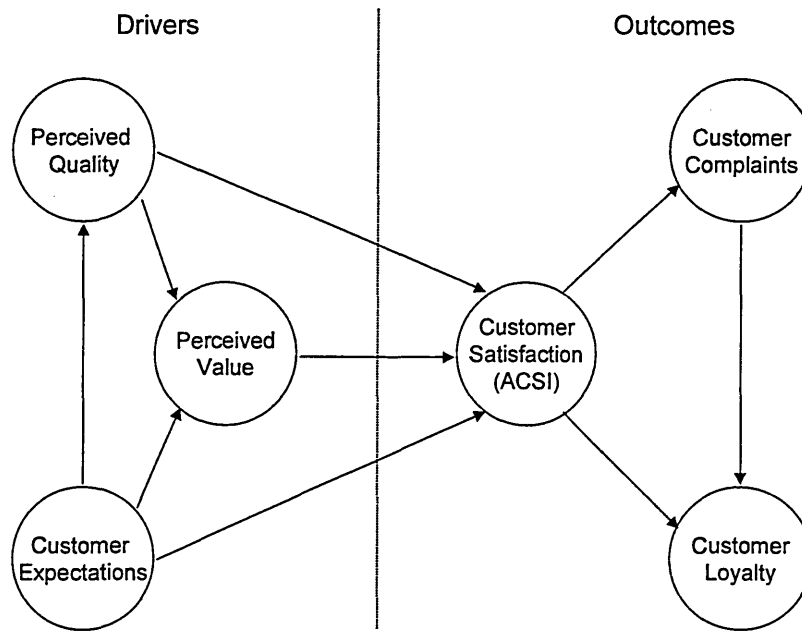
The index is constructed using a methodology that maximises the relationship between customer satisfaction and the likelihood of repeat purchase (Anderson et al. 1994).

The drivers and outcomes

The model can be seen to split into two separate parts:

- Drivers
- Outcomes

The dimensions which form the left hand side of the model can be seen as being the drivers of the model, while the dimensions on the right hand side are the outcomes. Figure 2.7 shows where the split occurs.

Figure 2.7 - Drivers and outcomes

On the driver's side the aim of the ACSI methodology is to ask questions which cover the following areas:

- Fitness for purpose
- Customisation
- Reliability

By asking questions in each of these areas throughout the driver side of the model, it is hoped that all areas of customer satisfaction measurement are covered. Throughout the development of the methodology for this project, this approach had not always been followed. This has happened to determine whether this approach is beneficial or not.

Each of the three areas are explained below with regard to the World Congress for Total Quality Management study, 1999.

- **Fitness for purpose**

In each of the drivers of the model, the fitness for purpose questions asks about how good a service or product was in relation to how it would be used with regard to the dimension that was being talked about. For example, in the soft quality dimension, the question for fitness for purpose asks, if the quality of the speakers was good enough.

- **Customisation**

The driver of customisation is asking how well or poorly a n organisations goods or services are aimed at meeting what the customer wants. For example, in the soft quality example the question asks whether the topics covered were relevant to the delegates needs.

- **Reliability**

Reliability of an organisation is always important. Do they do what they said they were going to? For example, did the congress cover the topics that it said it would in its advertising literature? Were the respondent's expectations fulfilled? If they were, to what extent were they fulfilled? These are all areas covered by the driver of reliability.

Some of the questions are asked more than once but from a slightly different angle. The respondent is first asked what they expected to happen, followed by their perceptions of what actually did occur in terms of quality.

2.4 Expectations

What do customers expect?

There are many different attributes that will influence what a particular individual is expecting from a service encounter. If the person has used the service before, then their last visit, especially if recent, will go a long way to forming the expectation. However, if the visit is the first, then what the person is expecting will have been formed by other methods. For example, one or more of the following could have formed a customer's expectation:

- competitors A service encounter with a rival company will at the least prepare the customer for the process that they will have to go through.
- advertising If the company in question has been using a very hard hitting advertising campaign, which promises many different things, the customer will go along expecting these promises to be carried out. By advertising, the company is raising its customer's expectations and it is, therefore, very important that it carries out what it promises, otherwise it will have some dissatisfied customers.

- past experience As has been mentioned above, if a customer has used a company before, they will have an idea as to the level of service that they will receive. However, on the actual service encounter, due to different levels of competency within the organisation, the level of service can vary by quite a margin. If the company is relatively small so that the customer always deals with the same contact person, this is less likely to be a problem. Areas where a staff's training is more likely to be of different standards are in sectors of the economy where employee turnover is high.
- friends and relatives experiences If a friend or relative has had good or bad experience with a particular organisation, then they are likely to pass on this information. Research by the TARP organisation has shown that a customer with cause to complain is far more likely to pass this on to friends and relatives than if they have a good experience. But, unfortunately for the organisation involved they are not likely to complain either, meaning that nothing can be done to rectify the bad experience. This is why Stew Leonard is quoted as saying, "A customer who complains is my best friend."
- reports / documentaries on companies e.g. Which Report etc. Consumer programmes and magazines can have an effect on a customers expectations. A lot depends on how much the customer believes the items that appear in the media and how great their belief in the past has been with these particular media products.

2.5 Quality - With regard to customer satisfaction

What is quality?

Quality is the degree of excellence to which a product is made, or a service is carried out. This dimension forms an important part of the model as it is measuring the customer perceptions about the actual encounter, whether it is the purchasing of a product or service.

Build in quality - Total Quality Management

If a quality product or service is required, it is important that quality is built in. Traditionally, products would be manufactured and then tested and inspected at the end to try and ensure that they complied with the requirements. However, invariably there would be faulty components or assembly somewhere inside the product which escaped detection. If quality is built in, each individual stage of manufacture is closely monitored by the people carrying out the process to ensure that the highest possible standards are attained.

If quality is viewed as part of a hierarchy leading to Total Quality Management (TQM), then Dahlgaard et. al. (1998) shows that the definition changes as an organisation moves towards the goal of TQM.

1. Quality - is to continuously satisfy customers' expectations.
 2. Total Quality - is to achieve quality at low cost.
 3. Total Quality Management - is to achieve total quality through everybody's participation.
- Dahlgaard et al. (1998)

As the research has developed, the European influence on the research indicated that quality should possibly be split into two separate dimensions, hard and soft quality.

Quality - Hardware Issues

This dimension looks at the issues surrounding the quality of the hardware. Hardware is defined as something that can be touched. It could be the quality of the paper that a letter is sent on, the quality of the decor of a department store, or, the quality of products manufactured. This dimension is similar to the tangibles dimension used in the SERVQUAL process, as described in *'Chapter 1 - Introduction'*.

Although this dimension is looking at the hard side of quality, it is still a soft measure. This is because it is the respondents perceived view of the different quality areas.

Quality - Human Issues

This dimension is concerned with the softer side of quality. The level of service provided by an organisation's front line staff. This dimension covers how the customer feels they were treated, or how well the customer perceives the clerk to have carried out his request.

Problems experienced with the quality dimensions

In the 1998 South Yorkshire Police survey (see '*Chapter 5 - An Empirical Study of the Public Sector Data*'), a number of problems were experienced by having the quality dimension split into two. The ACSI and Sheffield models with the single quality dimension worked fine. However, the ECSI model, which requires both a hard and soft quality dimension, had a number of different problems.

Without resorting to questions about the standards of the police cars, it was very difficult to ask questions pertaining to the hard quality dimension. Most peoples' initial contact with the police had been through the telephone, and therefore all quality issues fell in the 'soft' dimension. The decision was therefore taken to ignore hard quality for this survey as asking about the quality of police cars was deemed as being too far removed from the area of burglary.

2.6 Image

The image dimension of the model is one that has been added during development work. Although not a part of the original Fornell (1992) model, it was felt that further research was needed in this area. Therefore, questions regarding the perceived image of an organisation were included in the TQM and SYP 1998 surveys.

The dimension of Image has been included in the European model as an exogenous dimension, which feeds the dimensions of Perceived Value and Customer Loyalty.

The image of an organisation is very important, and the way customers perceive an organisation's image can have far reaching consequences. The customer's perception and the organisation's perception, should ideally be the same. However, this is not always the case, and when the two perceptions are out of line the consequences can be disastrous.

A number of different key words are used when talking about the image of an organisation. Words like, corporate identity, logos and trademarks, are all commonly associated with the image of an organisation.

The image of an organisation can be one based on quality, or, fashion and the two are not necessarily the same.

The image dimension was first included in the Norwegian Customer Satisfaction Barometer (Andreassen & Lindestad, 1996; NiM, 1996).

Corporate Identity

All organisations have an identity, whether they control it or not (Olins, 1984). An organisation's identity can project three things:

- Who you are
- What you do
- How you do it

Olins (1984)

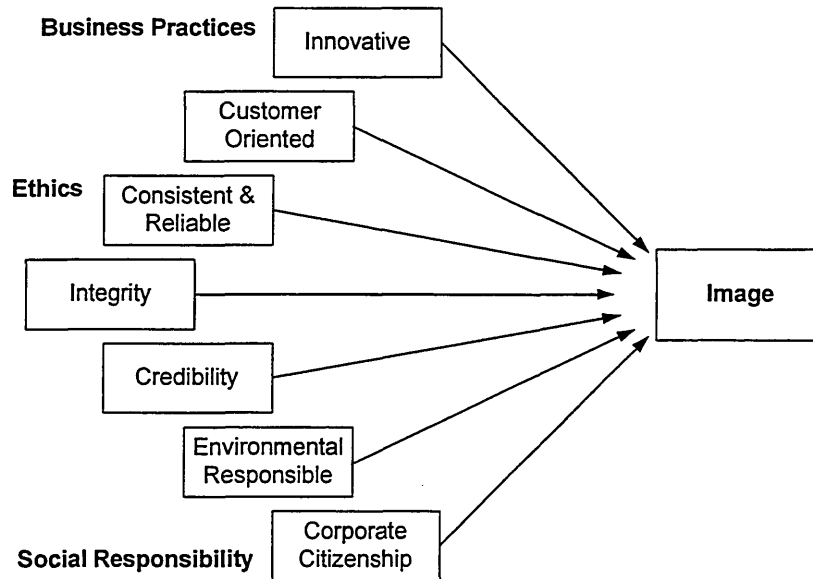
By measuring a customer's perception of what he feels an organisation does, allows a number of different things to take place. Firstly, from the model point of view, it is possible to feed this into the measurement process for customer satisfaction. Secondly, it is possible for the measured organisation to keep track of what its customers perceive as being its identity. This will therefore aid as a gauge to matching up the perceptions of the company and its customers.

The corporate identity was pioneered by American businesses, relating all products and services of a single enterprise to a unifying culture within a national and international signature, mark, or an arrangement of symbols that make it famous and contribute to its reputation (Rosenbaum, 1994).

Logos

Nearly all organisations have a logo of some description. This is used to identify the products or services within a particular organisation. Often logos are the first and only impression consumers encounter when they are shopping for a particular product or service (Miller & Brown, 1998).

Figure 2.8 shows that a number of different entities feed into the image of an organisation.

Figure 2.8 - Corporate Image Attributes

Naumann & Giel, 1995

2.7 Perceived Value

What do customers perceive as being 'value for money'?

Value for money differs from person to person. What is expensive to one person can be seen as cheap to another. Where a person lives, how much they earn and their own cultural background are just some aspects of how a person decides what is good value or not.

Value adding activities

Ideally, any activity that is carried out in a factory or office should be adding value to the product or service. Whether it is adding a component or set of components to a washing machine carcass, or processing an invoice for payment, the activity should be an improvement over what existed before. If this is not the case then it can be argued that the activity is not really required.

There are two sides to the concept of value. There is value given price, and value given quality. This is an important distinction to understand. While price is important, the product or service must be able to do what it is intended to do, or, be fit for purpose. It must be of sufficient quality, or the customer will go elsewhere regardless of how cheap it may seem. Likewise, the product or service may be the best that has ever been produced and be far superior to the next best competitor, but if the price is exorbitant, the customer will eventually go elsewhere for a less

quality, more cost effective solution. Policies designed to improve value for money will not necessarily enhance quality (Gaster, 1995).

In conclusion, the concept of value is complicated and closely linked with the dimension of quality. However, there is no neat and tidy relationship between value for money and quality (Gaster, 1995).

2.8 Customer Satisfaction

What is a customer?

Before we look at customer satisfaction, and what it means, firstly let us consider, What is a Customer?

At the most basic level a customer is a person who buys products or services. However, taking this one step further, we can see that, according to McNealy (1994), the customer can also take some of the following descriptions. These descriptions are often forgot by some organisations, or even treated as being irrelevant.

1. A customer is the most important person in any business.
2. A customer is not dependent on us. We are dependent on them.
3. A customer is not an interruption of our work. They are the purpose of it.
4. A customer does us a favour when they call. We are not doing them a favour by serving them.
5. A customer is a part of our business, not an outsider.
6. A customer is not a cold statistic. They are flesh and blood human being with feelings and emotions like our own.
7. A customer is not someone to argue or match wits with.
8. A customer is a person who brings us their wants. It is our job to fill those wants.
9. A customer is deserving of the most courteous and attentive treatment we can give them.
10. A customer is the lifeblood of this and every other business.
11. A customer is the person that makes it possible to pay our salaries.

What is Customer Satisfaction?

Customer satisfaction is a very important part of Total Quality Management. The level of customer satisfaction that exists for a given organisation, is what the index is aiming to measure.

While the different dimensions of the model influence the customer satisfaction score of an organisation, questions are also asked of the respondent, which directly relate to customer satisfaction. All three questions relate to the organisation as a whole and refer to distinctive areas.

The first question asks the respondent about their overall satisfaction with the organisation. The second question asks to what extent the respondent feels that their expectations have been met. The third question asks the respondent to think about an ideal organisation in whichever particular area is relevant, and compare the organisation they deal with against this ideal.

The dimension of customer satisfaction forms just a small part of the larger picture for any organisation and the score that they receive should only form part of their strategy for the future.

2.9 Complaints

"People who do complain and have their problem taken care of tend to be more loyal to the company than the people who were satisfied in the first place."

(Barsky, 1995)

A statement of this strength certainly highlights the necessity of attending to customer complaints. But just how can complaints be handled to a satisfactory conclusion? How can complaints be made a thing of the past?

The statement above could be interpreted as meaning that complaints are a good thing, as it will give an organisation the chance to shine and make an impact on a customer through its complaint handling procedures. This is fine until further analyses of the statistics on complaints are taken into account. TARP research carried out in the United States suggests that for every 20 complaints an organisation receives, there are a further 480 people who feel that they have cause for complaint (McNealy, 1994).

Why do people complain?

People generally complain because they are not happy with a product or service that they have purchased or used. Whether a person should complain or not, is a question that individuals answer differently depending on a host of different reasons. Some people will complain about almost anything no matter how trivial, whereas, others will never complain no matter how bad a service was. In between is everyone else who take a varying amount of provocation before a complaint is forthcoming.

How damaging are complaints?

If not dealt with to the customers' satisfaction, a complaint can lead to the irrevocable loss of a customer, and this can be the least of a companies concerns. More importantly, an unresolved issue, which has led to a complaint, can be very damaging, especially when the aggrieved customer starts telling their family, friends and even ultimately a television company, about how bad a particular company is.

What are the potential benefits of complaints?

Research has shown that by dealing with a customer's complaint quickly and efficiently, can lead to a more loyal customer than if the service had been carried out correctly in the first place.

Should complaints be included in the model?

Throughout the different case studies it was found that the dimension of complaints, or, questions referring to complaints did not really add to the model or to the results that were produced. In all cases removing the complaints questions led to an improvement in the fit of the data to the model.

When the complaints dimension was removed experimentation was carried out to see if the complaint's questions could be included in other dimensions. This always resulted in making the fit of the data to the model worse.

A number of the complaint's questions could not be included in the model calculation due to the small number of people that were able to complete them. One of the questions asked about how the respondents' complaint had been dealt with, obviously this could only be completed if the respondent had made a complaint, which many had not. The actual response rate was therefore too low to justify inclusion within the model.

2.10 Loyalty

What is loyalty?

Loyalty is the degree to which a customer will choose a particular company again over a rival company. If a customer is loyal the price will cease to be as important as the service itself. O'Keefe (1996) goes as far as to say, "customer loyalty is the major determinant of a company's business future". In other words, without loyal customers growth will be hard to achieve. How much truth there is in this statement is open to debate, as many examples exist of companies who have experienced rapid expansion only to have troubles later on. The argument in these cases would be that while expansion took place the company did not generate loyalty amongst its customers, who, therefore, failed to return and subsequently the company experienced financial troubles.

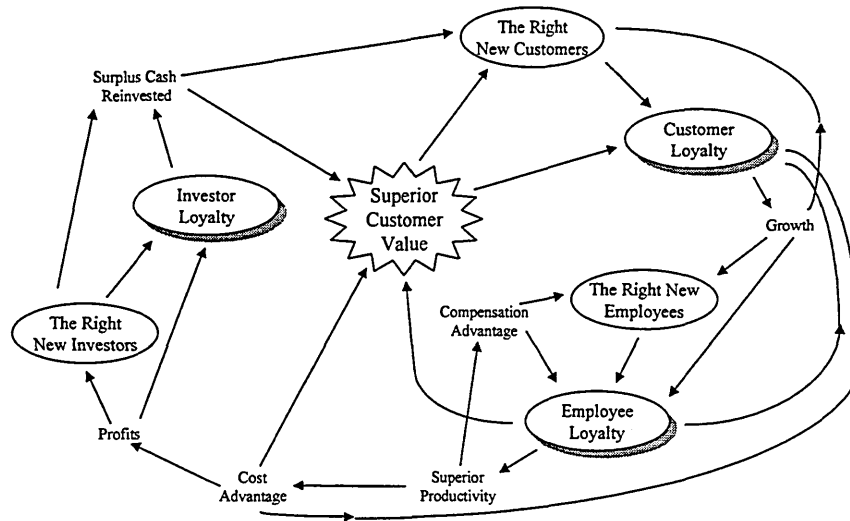
Heskett et. al. (1994), indicate that loyalty is a direct result of customer satisfaction. Therefore, its position after customer satisfaction at the end of the total process would appear to be the correct place.

What does it take to make a customer 'loyal'?

Building customer and employee loyalty means a long-term investment in providing value to both (O'Keefe, 1996). In his book 'The Loyalty Effect', Frederick Reichheld (1996), talks about the research that has shown that 'employee loyalty makes for customer loyalty and shareholder loyalty. In fact, the book highlights research that shows by increasing employee loyalty to the organisation, customer loyalty will follow. This is because customers like to be served by people who are well trained and know what they are doing with a minimum of fuss.

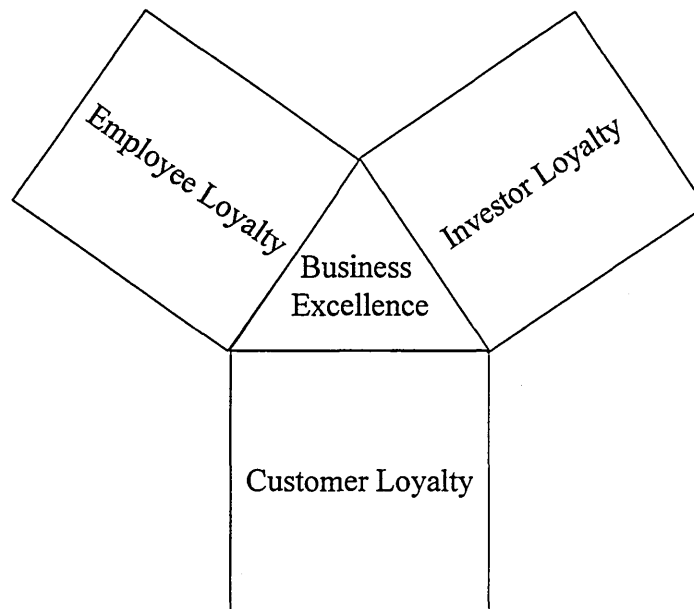
Companies have realised that by having loyal staff their costs also fall through less time and money being spent on recruitment and training. However, the downside to this is that when employees do leave, for whatever reason, the company can be vulnerable to the departure of a handful of key people (Economist, 1996).

Reichheld (1996) argues that loyalty is the key to growth within a company. As can be seen from figure 2.9, there is a knock on effect from increasing loyalty in one particular area.

Figure 2.9 - The loyalty-based cycle of growth

Reichheld (1996)

Figure 2.9 can probably be simplified to figure 2.10, which shows a triangle of business excellence surrounded by the ways of making this happen.

Figure 2.10 - The Triangle of Business Excellence

2.11 How will an index influence the Public \ Private Sectors?

The aim of the index is that it will have a positive effect on both the public and private sectors. If the index approach is accepted then its potential benefits to both sectors are immeasurable. However, it will provide a way for organisations from the two sectors to benchmark themselves:

- over time
- against competitors
- against other companies (non competitors)
- to see how they compare to the industry average
- to see how they compare to national average

Any focus on a customer satisfaction index can only be beneficial for the economy as a whole, as the approach also looks at the different areas that directly and indirectly influence customer satisfaction. These other dimensions are therefore taken into account when calculating the index totals. The index approach does not look at customer satisfaction in isolation as some other techniques seem to do, but instead treats customer satisfaction as part of a holistic approach to providing better service to customers.

2.12 Conclusion

In conclusion, it can be seen that customer satisfaction is made up of, and influenced by, many different entities that can all be influenced and thus have an effect on what a customer thinks about an organisation. It is therefore important to bear the other aspects in mind when setting out to improve customer satisfaction.

The whole process of customer satisfaction within an organisation is on the whole cyclical. The majority of transactions are carried out with an organisation who a customer has had some previous knowledge. It could therefore be claimed that there is a link between customer loyalty and customer expectations. If the level of customer loyalty falls by a large enough margin, the customer will go elsewhere, thus breaking the cycle, and reducing customer satisfaction to zero. After all a person has to be using an organisation to have a level of customer satisfaction.

By measuring the different dimensions of the customer satisfaction model, an organisation using the methodology can see in which areas of customer perception they are excelling or failing. Thus allowing them to work on the areas that they are weak in.

Customer Satisfaction is not a single independent entity but is influenced by many other entities. Likewise, the entity of customer satisfaction appears in other models with other entities, which are measuring other areas. For example, customer satisfaction is an important part of many of the total quality management guru's methodologies (see '*Chapter 1 – Introduction*' for more details), as it also an important part of Kanji's (1998) Business Excellence Model.

**Chapter 3 -
Methodology - A Customer Satisfaction Index**

Path or structural equation models with latent variables combine econometric prediction with psychometric modelling of variables indirectly observed by multiple manifest variables (Fornell & Cha, 1994).

Before we look at the Structural Equation Modelling (SEM) techniques that have been used throughout the course of this research, it would be useful to see where these methodologies have originated. Therefore, if we first look at the Factor Analysis approach, this will make the explanation of SEM more understandable.

3.1 Factor Analysis

Background

Karl Pearson and Charles Spearman, among others, were some of the first to start developing Factor Analysis to define and measure 'intelligence'. Therefore, factor analysis was nurtured and developed by scientists interested in psychometric measurement (Johnson & Wichern, 1992). It was with the advent of powerful computing that its development as a statistical method has been possible.

The essential purpose of factor analysis is to describe, if possible, the covariance relationships among many variables in terms of a few underlying, but unobservable, random quantities called factors (Johnson & Wichern, 1992).

Factor analysis can help to identify underlying, not directly observable, constructs, through a process involving the observed correlations of the variables. For example, variables such as consumer ratings of products in a survey can be expressed as a function of factors such as quality and utility (Norusis, 1988).

Throughout the research a factor analysis has been carried out on each of the different data sets (these can be seen in appendix containing tables and graphs for each of the individual data sets, namely appendices 10, 11, 18 and 22). The initial purpose of using factor analysis was as a way of explaining structural equation modelling. In addition, the factor analyses carried out also go some way towards supporting the allocation of the manifest variables to the relevant latent variables.

3.2 Structural Equation Modelling

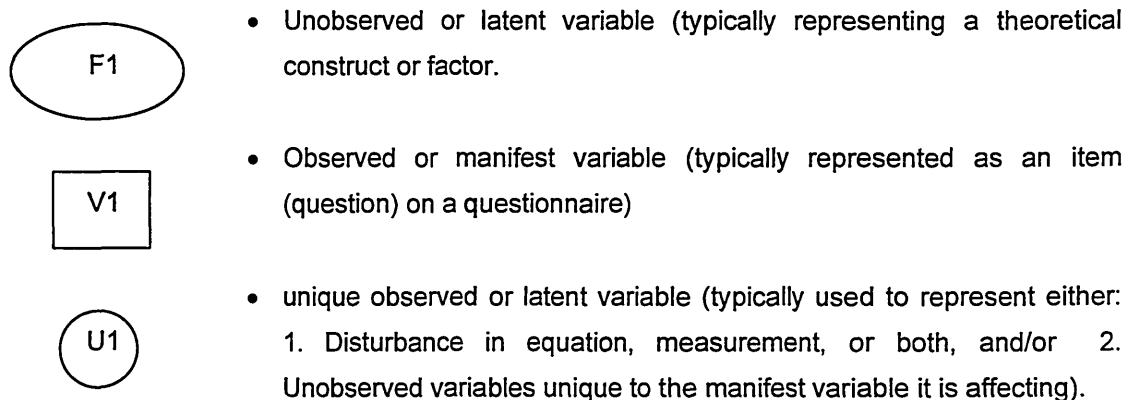
Background

Structural Equation Modelling (SEM), is a very general, chiefly cross sectional, statistical modelling technique. Factor analysis, path analysis and regression all represent special cases of SEM (SEMNET, 1996). However, whereas the factors in factor analysis are calculated after running the procedure, in SEM, the latent variables are defined before, with the model defining the weights of the variables that feed into each latent variable.

The symbolic representation of a SEM

In creating a SEM, the different shaped boxes have different meanings. Figure 3.1 shows an explanation of the meanings.

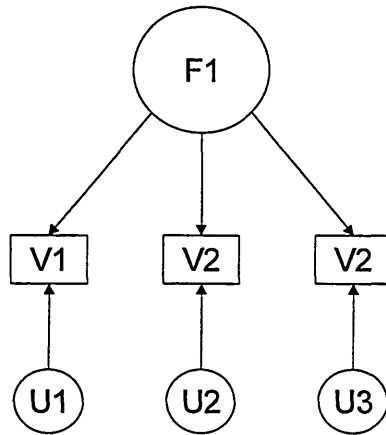
Figure 3.1 - SEM - The meanings of the boxes



Chin, 1995

Arranging the model

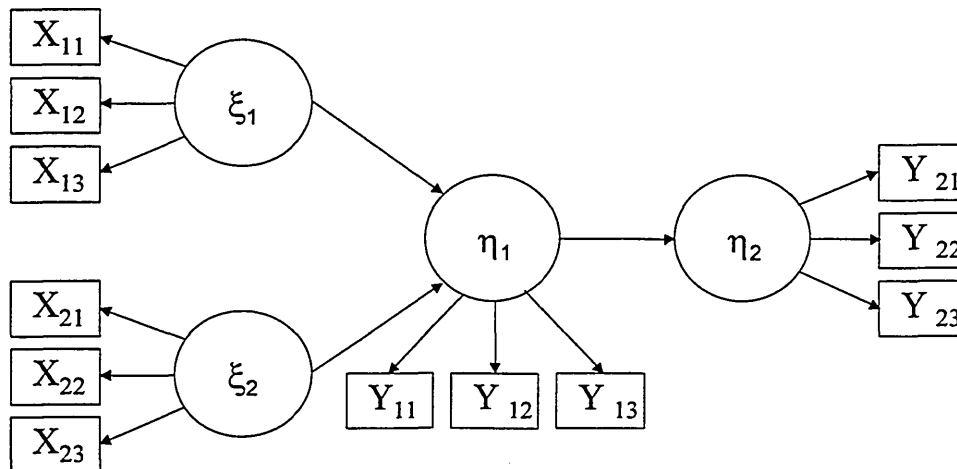
A SEM must be arranged in a particular way if it is to be recognised as being such by both humans and computers. Figure 3.2 shows an example of a basic SEM with one latent variable.

Figure 3.2 - Basic Structural Model (A single factor model)

Chin (1995)

The observed variables (V1 to V3) all feed the latent (unobserved variable) F1. In a case like this where there is only one latent variable, the data in the observed variables could be analysed by simply calculating the means and variances etc for each of the variables. However, the strength of the SEM comes from the fact that instead of the calculations been solely based on the data within one particular variable, the SEM also takes into account the responses made to the other variables before a weight for each observed variable is calculated. In simple terms, the SEM model takes into account a respondents responses to all questions rather than isolating a particular question.

Most SEMs will have more than one latent variable (see figure 3.3). Therefore, arrows from one latent variable, to another build up the model. The arrows indicate an influence or cause from one latent variable to another.

Figure 3.3 - A Simple Structural Equation Model

Fornell & Cha (1994)

The circles identified with a ' ξ ' indicate exogenous latent variables, while the circles identified with a ' η ', indicate endogenous latent variables. The boxes containing a 'X' are the observed (manifest) variables, which feed the exogenous latent variables, and the boxes containing 'Y', are the observed variables which feed the endogenous latent variables. The subscript numbers indicate a particular variable's location within the matrices, which are used for calculation purposes (see later in this chapter).

What is a latent variable?

From the point of view of this research, all the areas that have been referred to previously as 'dimensions' are latent variables. Therefore, the dimensions of:

- Human quality
- Hardware quality
- Expectations
- Image
- Value
- Customer satisfaction
- Complaints
- Loyalty

are all latent variables of the various structural equation models that have been experimented with throughout the course of this research.

Customer satisfaction is a latent variable, which means it is not measured directly, but is dependent on other variables, which also are of a latent construct (Kristensen & Martensen, (1996), Krzanowski & Marriott (1995)). At the same time customer satisfaction is an explanatory variable for (in the case of the European Model) customer loyalty, which further determines the corporate performance (Kristensen & Martensen, 1996).

Different techniques of Structural Equation Modelling

During the course of this research, besides factor analysis, two specific approaches of SEM have been employed. These are maximum likelihood (ML) and fixed-point (FP) estimation. An understanding of the difference between these two methodologies is required before progressing any further. Each of these methodologies has a corresponding computer programme which aids in the calculations. Maximum likelihood uses AMOS (LISREL), while fixed point uses the PLS methodology.

Structural Models with Latent Variables

There are several indicators to measure a latent variable. These produce the following measurement model (ECSI Seminar, 1999).

$$X_1 = \lambda_{x1} \xi_1 + \varepsilon_1$$

Manifest variable indicator

coefficient

Latent variable

error

$$Y_1 = \lambda_{Y1} \eta + \delta_1$$

The structure among the latents then becomes:

$$\eta = \gamma_1 \xi_1 + \gamma_2 \xi_2 + \mu$$

dependent latent

coefficients

error

(ECSI Seminar, 1999)

R^2 measures how well η can be predicted by ξ_1 and ξ_2

The R^2 value indicates how much of an effect the model before the latent variable is having on that particular latent variable. For example, if the R^2 value is 0.5, this indicates that the model before this latent variable explains 50% of the variation in the latent variable.

These formulae can then be developed for the particular methodology that is required for calculation purposes.

3.3 The Maximum Likelihood Method (LISREL)

Karl Jöreskog provided an operative algorithm for maximum likelihood estimation of factor models in 1967, and the maximum likelihood algorithm, LISREL, was developed in 1970 (Jöreskog, 1970).

Retherford and Choe (1993) illustrate the maximum likelihood method as can be seen below.

Consider the simple model:

$$\text{Logit } P = a + bX$$

which can be written as

$$P = \frac{1}{1 + e^{-(a + bX)}}$$

Assuming the mathematical forms of these equations are correct, we do not know the values of a and b , which are treated as unknowns.

The first step is to formulate a likelihood function, L . L is the probability of observing particular sample data under the assumption that the model is true. That is, we assume that the mathematical form of the model, as given above, is correct, but we don't yet know the values of a and b . We choose a and b so that L is maximised. In other words, we choose values of the unknown parameters that maximise the likelihood of the observed data and call these parameters best fitting parameters. The method can be thought of as considering all possible combinations of a and b , calculating L for each combination, and picking the combination that yields the largest value of L (Retherford & Choe, 1993).

The Maximum Likelihood Method

Certain assumptions are made when using maximum likelihood. It assumes that the data is normally distributed and that the variables are made up of continuous data.

- The multivariate normality is determined by the covariance matrix Σ .
- Calculate the observed covariance matrix Σ_0 for all the manifests.
- Use the structural model to obtain a theoretically derived covariance matrix Σ_T

This includes the coefficients:

$$\lambda, \gamma, \delta^2$$

- Insert starting values $\hat{\lambda}, \hat{\gamma}, \hat{\delta}$ to obtain $\hat{\Sigma}$
- Compare the differences $\Sigma_0 - \hat{\Sigma}$
- If it is close enough stop, otherwise obtain new values for $\hat{\lambda}, \hat{\gamma}, \hat{\delta}$ and continue.

The difference between the observed and estimated covariance matrices is minimised and the likelihood based on the multivariate normal is maximised (ECSI Seminar, 1999).

3.4 Fixed Point Estimation (Partial Least Squares)

Partial Least Squares (PLS) was originally introduced as an alternative to maximum likelihood LISREL as a way to avoid problems of improper solutions and factor indeterminacy as well as the violations of distributional assumptions (Fornell & Bookstein, 1982; Fornell 1982; Fornell & Cha, 1994).

The PLS approach was initially developed by Herman Wold, who questioned the general fitness of covariance structure models as implemented by LISREL (Fornell & Cha, 1994). In many studies, this one included, the data generated is not normally distributed, a requirement of the LISREL maximum likelihood approach.

Weight relations for each of the observed variables are calculated under the PLS methodology.

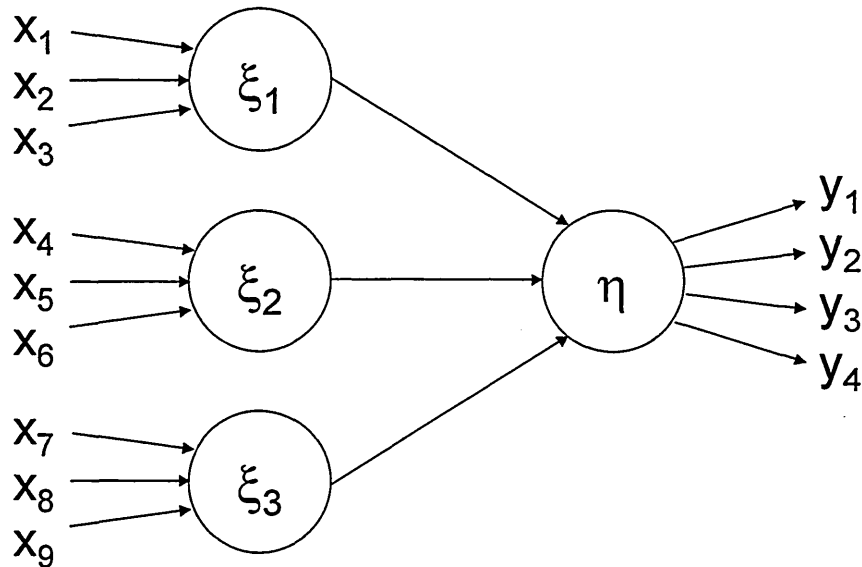
By using weight relations, PLS estimates case values of the latent variables, and therefore, the problem of factor indeterminacy is eliminated (Fornell & Cha, 1994). In addition, the least squares estimation method used by PLS eliminates the problem of improper solutions (Fornell & Cha, 1994).

PLS has been used on several marketing studies including the customer satisfaction index approach in both the United States and Sweden (Fornell, 1992).

A theoretical explanation for PLS can be seen below.

- Because the estimate process for PLS is different to maximum likelihood, the measurement models are reversed in comparison to AMOS (the arrows from the manifest variables to the latent variables point in the opposite direction for PLS when comparing the same model with the AMOS), see figure 3.4.

Figure 3.4 - An example of a PLS model



ECSI Seminar, 1999

$$\hat{\xi}_1 = w_{1x}x_1 + w_{2x}x_2 + w_{3x}x_3$$

$$\hat{\xi}_2 = w_{4x}x_4 + w_{5x}x_5 + w_{6x}x_6$$

$$\hat{\eta} = w_{1y}y_1 + w_{2y}y_2 + w_{3y}y_3$$

- Start values are given to $\{w_{1x} \dots w_{6x}, w_{1y} \dots w_{3y}\}$

$$(\hat{\xi}_1, \hat{\xi}_2, \hat{\eta})$$

The latent variables are calculated and standardised to avoid scale indeterminacy

- Inner Updates: (Blockwise, each latent variable)

$(\hat{\gamma}_1, \hat{\gamma}_2)$ are calculated using Ordinary Least Squares (OLS)

$\hat{\eta} = \hat{\gamma}_1\hat{\xi}_1 + \hat{\gamma}_2\hat{\xi}_2$ is formed

$\hat{\xi}_1 = \gamma_{\hat{\xi}_1\hat{\eta}}\hat{\eta}$ is formed

$\hat{\xi}_2 = \gamma_{\hat{\xi}_2\hat{\eta}}\hat{\eta}$ is formed

- Outer Updates

New weights $\{\hat{w}_{1x} \dots \hat{w}_{6x}, \hat{w}_{1y} \dots \hat{w}_{3y}\}$ are calculated using $(\hat{\xi}_1, \hat{\xi}_2, \hat{\eta})$ and $x_1 \dots x_6, y_1 \dots y_3$ by OLS.

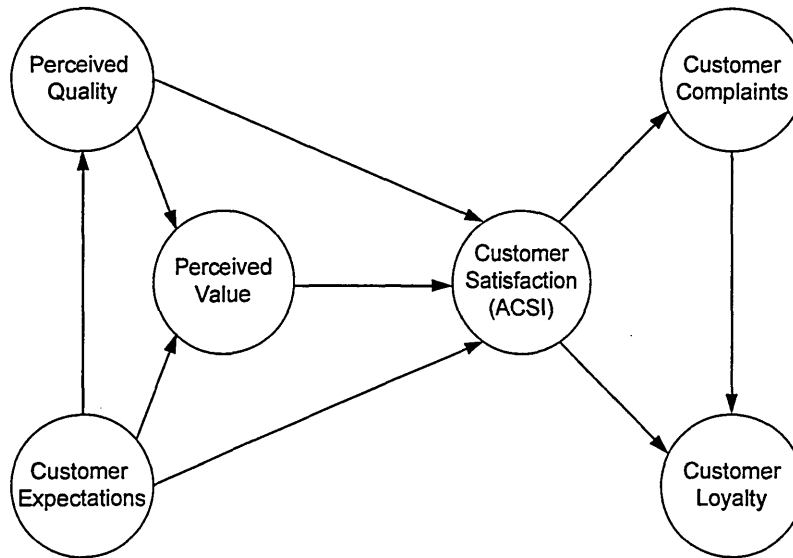
Convergence occurs when $\{\hat{w}_{1x} \dots \hat{w}_{6x}, \hat{w}_{1y} \dots \hat{w}_{3y}\}$ are stable.

The proxies $\hat{\xi}_1, \hat{\xi}_2, \hat{\eta}$ are used to find $\lambda_{x_1}, \dots, \lambda_{x_5}, \lambda_{y_1}, \dots, \lambda_{y_3}$ by OLS of X on ξ .
(ECSI Seminar, 1999)

Customer Satisfaction Index and Structural Equation Modelling

The research started by looking at the SEM devised by Fornell (1992) for the Swedish Customer Satisfaction Barometer (SCSB), and was subsequently used by the American Customer Satisfaction Index (ACSI). The model was used as an initial starting point for work to develop an Index for the UK. From the SCSB further models were developed, which better suited the data generated by the British culture. Figure 3.5 shows the initial model used by Fornell.

Figure 3.5 - The SEM used for the Swedish Customer Satisfaction Barometer



Fornell, 1992

3.5 Critique of Structural Equation Modelling

Fixed Point or Maximum Likelihood

One of the major difference between PLS and AMOS is the theory behind how they make their calculations. PLS is based on the Fixed-Point (FP) methodology while LISREL (AMOS) is based around, Maximum Likelihood (ML).

FP differs from ML in its principles and assumptions. In ML estimation, the probability of the observed data given the hypothesised model is maximised. However, PLS estimation minimises residual variances under a FP constraint (Fornell and Bookstein, 1982).

LISREL poses and solves the global optimisation problem (ML) explicitly. PLS limits its explicit optimisation computations to ordinary multiple regression (Fornell & Bookstein, 1982).

Advantages of AMOS (LISREL)

At the most basic level one of the major advantages of the AMOS package is its ability to show the SEM in a graphical format. This allows the user at a glance to be able to see what is happening within the model and make necessary changes quickly. Thus, seeing what the effect of trying this or that would have on the overall goodness of fit results. Added to this, if a variable is unidentified (see below for more explanation), it will tell the user how many additional constraints will be required and on which paths these constraints are required. In comparison, if the SAS.PLS methodology cannot execute, the error message is far more complicated and points to a line in the programme where it failed to execute. It should be noted, however, that the PLS methodology does not require additional constraints on the influences between different latent variables.

Since it is a maximum likelihood procedure, the asymptotical properties are known, that is to say standard errors and goodness of fit statistics can be computed (ECSI Seminar, 1999).

A further advantage is that the maximum likelihood approach aims at selecting the best fitting model (ECSI Seminar, 1999).

A model is said to be identified, if there is one optimal value for each unknown parameter. If the model is identified, the iterative procedure usually converges to an optimal solution with parameter estimates that best fit the data (Scientific Software International Home Page, 1999).

Disadvantages of AMOS (LISREL)

Using the chi-square statistic in AMOS can sometimes be misleading. As Fornell and Larcker (1981) point out, the chi-square may indicate a good fit between the model and the data even though the measures and theory are inadequate. Secondly, if the sample size is small, $N \cdot F_0$ may not be chi-square distributed (Fornell & Larcker, 1981). Therefore, although the chi-square is a useful way of ascertaining the goodness of fit of the observed data to the theoretical model, it does not follow that this is an accurate representation of what is actually happening. In fact, the goodness of fit can actually improve as properties of the measures and / or the relationships between the theoretical constructs decline (Fornell & Larcker, 1981).

One of the other observed outputs of the actual case studies was the distributions that individual questions generated. Many of the questions generated skewed distributions, which while not causing any problems for the PLS, is not what the AMOS (LISREL) requires. The AMOS methodology requires that the data it is analysing is normally distributed and is sensitive to data that is skewed (ECSI Seminar, 1999). However, a large number of the sliding scale questions were not normally distributed as can be seen by looking at the results in appendices 12, 15, 19,

24 and 27, and therefore cast doubt over the appropriateness of the technique.

The maximum likelihood methodology inverts the matrices. If the data is ill conditioned, it cannot be done, which in turn stops the procedure (ECSI Seminar, 1999).

In principle, the methodology requires continuous data. The majority of the data produced for this study has been of this type. It also requires a large number of observations (500) (ECSI Seminar, 1999), something which this research has not produced.

Advantages of PLS

It has been shown that the factor indeterminacy via PLS can effectively remedy improper estimates which, can be caused by the path-analytic fitting objective behind LISREL (Fornell & Bookstein, 1982).

PLS enables the analysis of very small samples (Lohmöller (1982), Igbaria et al. (1995)), these can be as small as ten times the number of indicators on the most formative construct (Green et. al., 1995).

The PLS results are interpreted in two stages, firstly, the assessment of the reliability, and, validity of the measurement model. Secondly, the assessment of the structural model (Green et. al., 1995). Assuming that the measurement part has been carried out satisfactorily (more details of this can be found in each of the case studies found in Chapters 5 to 7), the assessment of the structural model is then of paramount importance. Each part of the measurement process is important, an error in any stage will invalidate the end results. To this end proven surveying techniques were employed for the data collection part of the research.

Due to the robustness of the PLS methodology, the technique is particularly applicable in research areas where theory is not as well developed as that demanded by LISREL (Igbaria et al. 1995).

The distributional problems that are associated with the LISREL technique do not apply to PLS, therefore, no assumptions about the distributions need to be made (ECSI Seminar, 1999).

Disadvantages of PLS

A limitation of the PLS analysis is that it is based on a linear model. As such it ignores all non-linear relationships, including thresholds, saturation effects, and scale effects (Green et. al., 1995).

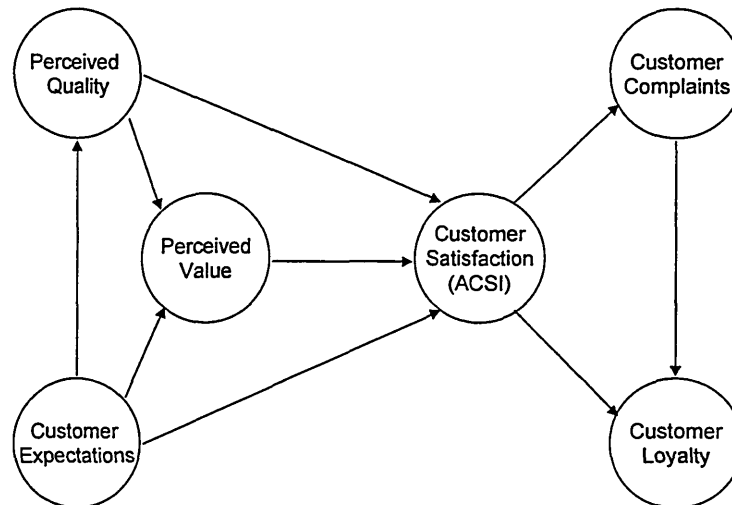
The statistical properties are not as well known as they are for the maximum likelihood approach.

After weighing up the different arguments for and against each of the two different SEM techniques, it was decided to use the PLS methodology. The PLS methodology was required for calculating the index scores and could also deal with non-normal data. Throughout the majority of surveys carried out for customer satisfaction measurement there are questions that produce non-normal data, therefore this limitation meant that PLS was the first choice.

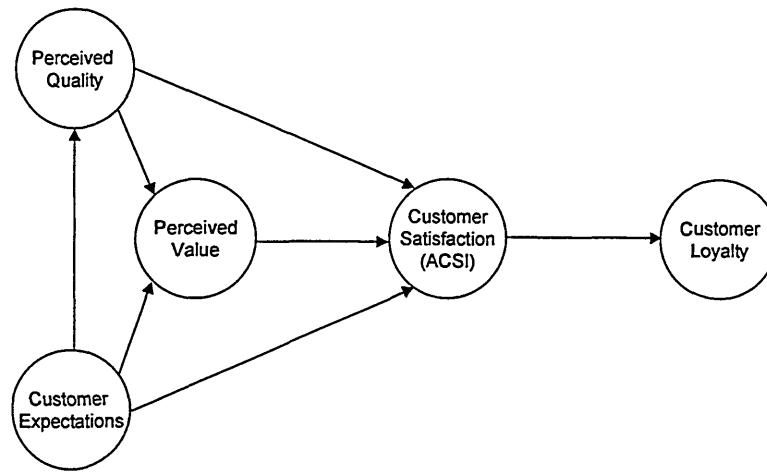
3.6 The Three Models

Three different models of customer satisfaction measurement have been used during this research project. The three models can be seen figures 3.6 to 3.8 below.

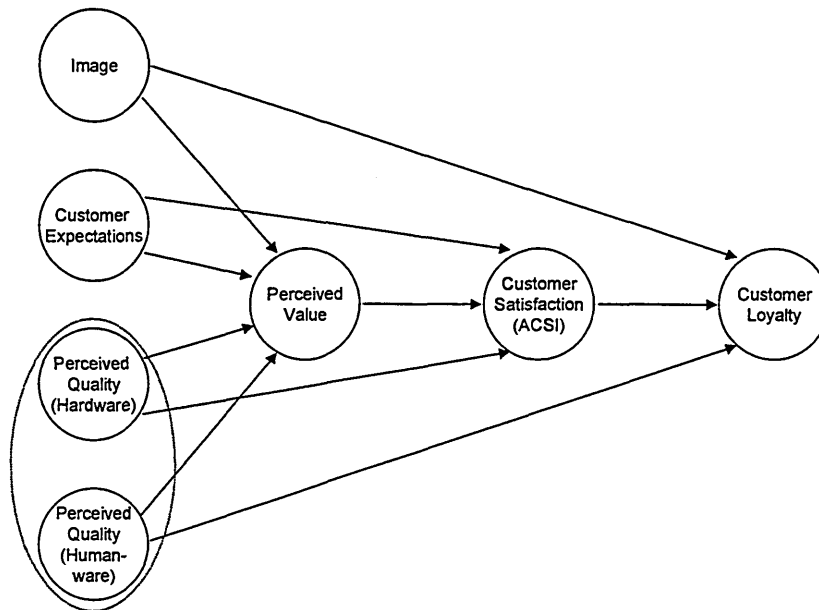
Figure 3.6 - The American Customer Satisfaction Index (ACSI)



Fornell (1992)

Figure 3.7 - The Sheffield Model

Gorst et. al. (1998)

Figure 3.8 - The European Customer Satisfaction Index (ECSI)

Kristensen et. al. 1999

As can be seen from the three models in figures 3.6 to 3.8 above there are some slight differences between each of the models, including the addition and removal of certain latent variables.

The Sheffield Model differs from the ACSI model in that it does not include the latent variable of complaints. While the model might not look significantly different the actual conceptual omission is quite significant.

The ECSI model contains most of the standard latent variables although its structure is slightly different and it includes the addition of the latent variable for image. The other significant change within this model is the splitting of the latent variable of quality into two, which separates the concept of quality into two distinct parts, hard and soft.

3.7 Survey Methodology - Collecting the Data

The data for all of the studies was collected using standard techniques. All the surveys were carried out by post (except for the Fourth World Congress). Each questionnaire was accompanied by a covering letter, and an explanation sheet on how to complete the questionnaire. A pre-paid envelope was also sent with each questionnaire.

On some of the surveys a reminder letter was sent approximately two weeks after the initial questionnaire.

The names and addresses for the respondents were supplied by the corresponding organisation with whom the work was been carried out.

Upon return of a questionnaire, its return was logged for future reference. At all times confidentiality was stressed and although it was possible to identify an individuals completed questionnaire, this information was never passed to the client organisation.

Data entry was carried out using the SPSS programme, which allowed the data to be thoroughly analysed using empirical statistical techniques (see '*Chapter 5 - An Empirical Study of the Public Sector Data*'). SPSS also allowed the data to be exported to a number of other programmes when required.

The survey process was carried out entirely by myself, and the processes were part of the research into the methods. The university's Survey and Statistical Research Centre (SSRC) was only used as an address for the returned questionnaires. At no time was the research work carried out on their behalf, or in conjunction with them.

The police surveys were carried out for pure research purposes. The people identified for analysis, were supplied by South Yorkshire Police. The analysis was not intended to produce unbiased estimates and therefore there is a degree of bias in the data. The data was collected to prove the questionnaire and to allow analysis using the Partial Least Squares (PLS) methodology.

Cleaning the Data

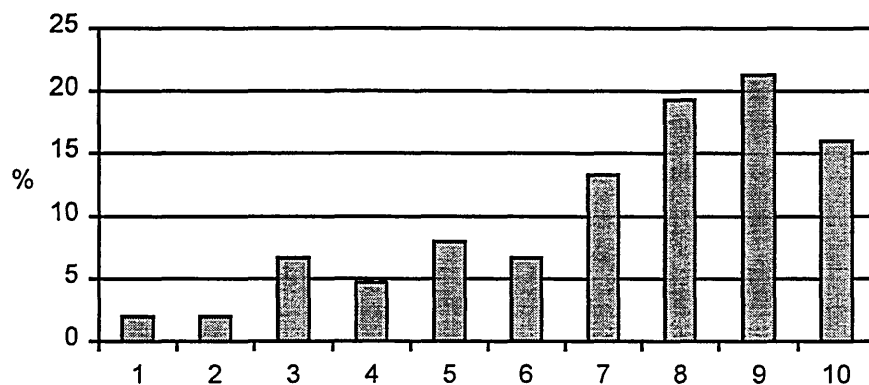
In order for the PLS programme to successfully analyse the data, the information has to be arranged in a particular way to ensure that the data and the models can be mapped together.

The South Yorkshire Police (SYP) survey (1997) produced 164 useable returns. However, a number of these did have one or two missing values. The PLS programme will not accept missing values and, therefore, either the questionnaires with missing values had to be discarded, or something done about the missing values. Due to the small number of returns to start removing questionnaires because of one or two missing values was not deemed to be in the best interests of the project. Therefore, values were imputed as and where required. These are described below.

Sliding scale questions

Where a value for a sliding scale question was missing the 'median' for that particular question overall was included. The median was used for a number of different reasons. Firstly, the rest of the questions were all whole numbers and to include the 'mean' would have moved away from this. Secondly, a number of the questions were skewed (see figure 3.9) with a number of outlying responses lowering the mean. Therefore, the median value can be seen to give a more accurate picture of what the average person thought.

Figure 3.9 - Results of question 12). South Yorkshire Police data



Questions requiring a number

For example, how many times have you been less than satisfied with SYP services?

The questions asked the respondent to enter the actual number in a box. This created a problem in that the upper end of a scale was unknown. Therefore, the responses were treated

to yes \ no question, with any number entered being converted to a '1' and everything else remaining as a '0'. For the respondents who failed to answer the question, it was assumed that they had not had cause to be less than satisfied and, therefore, a '0' was entered for that particular person.

Questions with a low response rate

For example, have you raised your dissatisfaction with the police?

This particular question in the SYP, 1997 case study, had a very low response rate due to the fact that the majority of people did not have cause for complaint. Therefore, this question was not used in the calculation of the model, and no further action was required.

Over the life of the project a number of different case studies have been completed. This chapter will look at each of the different case studies on turn and discuss each ones contribution to the overall model development.

Data Screening

After ensuring that a complete data set was available it was then necessary to screen the data to ensure that values were within the required ranges and any inconsistencies within the data were removed.

3.8 Developing the Questionnaire

Introduction

The different data sets that have been used during this research, have been collected using a self-completion, postal questionnaire. To this end its design and looks were of paramount importance. The initial look of the questionnaire when first viewed by the respondent is extremely important. It is this initial view of whether it looks straightforward to complete, complicated, untidy, pleasant on the eye, etc., which will effect firstly, the likelihood of completion and return, and secondly, correct completion.

The overall aim of any survey work is to obtain the views as of many of the target population as is possible. The nature of the index approach and the way in which the Partial Least Squares (PLS) programme works, means that missing values cause problems. Therefore, it is important that the questionnaire is completed with no gaps in the information.

The design, content and wording of the questionnaires have been constantly developed over the life of the research project. From an initial start using a very basic word-processed format, the questionnaire has developed to have all the questions contained within boxes with a more logical approach required for its completion. The questionnaire aims to take the respondents through the service encounter in a chronological order, although later studies have asked the overall satisfaction question at the beginning.

During the research project there have been two major turning points in the look of the questionnaire. The first came when adapting the questionnaire design from that of the American Customer Satisfaction Index (ACSI) to that of one which was far less cluttered and easier on the eye. The second came after reviewing the questionnaire designs of a leading Hong Kong hotel.

While all questionnaires cover the core of questions required for the index approach, further questions can also be added to explore other areas if so required by the organisation in question. In the case of the South Yorkshire Polices study (1997), further questions were included to cover the areas as laid down by the Association of Chief Police Officers (ACPO). This was carried out with no detrimental effect to the core questions. These extra questions were not included on the index calculations.

The ultimate aim has been to produce a questionnaire with a generic core of questions, that looks professional, is easy to understand and generates the number of responses which is required in order to make the results significant. The questionnaire is one part of the survey process, but its successful execution is critical to the overall scheme of providing a customer satisfaction index.

While the core of questions is generic, they are only generic in terms of what the individual questions are asking. They are not exactly generic from one organisation to the next. Depending on the organisation being surveyed, it may be necessary to change the wording of a question so as to fit in with the type of organisation been surveyed.

This section takes the reader through the complete process that has gone into the questionnaire development from the first customer satisfaction index questionnaire for Sheffield Hallam University's cafeteria service, through to the development of questionnaires for a European index.

Why a 10 point scale?

Initially, a ten-point scale has been used solely because that is what Fornell in his Swedish Customer Satisfaction Barometer uses. Using a ten-point scale stops people from choosing the middle value and makes them lean slightly in favour or against a given subject. However, in reality the two middle options of '5' and '6' are treated equally as being undecided. By using a ten point scale also brings the added advantage of being able to treat the scale as a continuous piece of data, a requirement (in principle) of the LISREL methodology (ECSI Seminar, 1999).

There are other advantages of using a ten-point scale. These can be seen below:

- A 10 point scale requires only 71.3% of the sample required for 5 point scales (Wittink & Bayer, 1994).
- It is possible to show that a 5 point scale only has 71.3% of the power of a 10 point scale (Wittink & Bayer, 1994).
- The measurement of overall satisfaction has to be reliable and valid (Wittink & Bayer, 1994).
- If the two measurement scales have the same sample sizes, the 10 point scale provides a greater opportunity to detect changes in overall satisfaction (Wittink & Bayer, 1994).
- If customer satisfaction results are used to motivate people to improve their efforts, the more room for improvement, the greater the scale's sensitivity (Wittink & Bayer, 1994).
- 10 point scales were adopted, in part, (for the Swedish Customer Satisfaction Barometer) to minimise skewness in the distribution of satisfaction scores (Fornell, 1992).

For all the reasons above and the success of a ten-point scale throughout the different case studies (see Chapters 5 to 7), no reason for changing to either 5 or 7 point Likert scales has been forthcoming.

The studies involved

As the research has progressed, a number of different questionnaires have been developed. Some were used for survey work, and others were specifically developed for a particular industry or organisation, but never actually tested on customers. These questionnaires were useful from the perspective of showing how easy or difficult it would be to use the questionnaire over the whole economy. Below can be seen a summary of the questionnaires developed and the appendix number where a copy of each can be found.

	Appendix
• South Yorkshire Police, 1997	3
• Yorkshire Purchasing Organisation	4
• Third World Congress of Total Quality Management (1998)	5
• South Yorkshire Police, 1998	6
• Fourth World Congress of Total Quality Management (1999)	7

The initial questionnaires were designed using the Word package from Microsoft. Subsequent questionnaires became more graphical in their appearance and, therefore, their production was switched to the PowerPoint package, which provided better drawing facilities.

The initial questionnaires required the respondent to circle a number. The later questionnaires required the respondent to tick a box. By moving to a tick box type approach, this paved the way for the questionnaires to be electronically read in the future.

The cafeteria and library questionnaires

The first survey to be completed was one that asked the students of Sheffield Hallam University (SHU) about their experiences of the universities cafeteria facilities. Initially, two very similar questionnaires were developed for comparison purposes. One for the cafeteria, and one for the library. Both surveys produced low returns, the library returns were so low that analysis of the data could not take place. However, while analysis of the results could not be completed, the survey did show that the questionnaire was acceptable.

As an initial starting point, an ACSI questionnaire was used for writing the cafeteria and library questionnaires. However, due to the ACSI questionnaire been written in the United States (US) some translation was required to produce a questionnaire of 'linguistic functional equivalence' (Naumann & Giel, 1995).

At the first pass the questionnaire was left the same except for the organisation name being changed to Sheffield Hallam University, and the service to the relevant one.

A large number of the initial changes were purely cosmetic. The questionnaire was typed so as to be easy for a respondent to self-complete, whereas the original ACSI questionnaire was completed using a telephone survey.

On the sliding scale questions, after the respondent had been told which area to think about, there would follow a standard sentence which said something to the effect, "Using a ten point scale where 1 means 'falls short of expectations', and 10 means 'exceeds expectations' to what

extent has SHU fallen short of or exceeded your expectations?" This type of statement appeared a number of times and added to the overall length while making the questionnaire appear more complicated than it actually was. Therefore, the statement was removed wherever it appeared, and in its place at the bottom of each page, a footer was added that reminded the respondent to circle only one number.

A number of questions were removed. These included some questions which referred to price and how much the cafeteria would have to lower its prices before a customer would return etc. There were a number of reasons why these questions were removed. Firstly, the questions were rather complicated and deemed difficult to answer, therefore, with the questionnaire being self-completion and no further explanation being available, the questions were judged to have a high chance of non-response. Secondly, the questionnaire was a pilot for a more general public sector study and, therefore, questions referring to price were unlikely to be directly used subsequently. Thirdly, with the questionnaire being originally intended for library users as well, and, in order to maintain continuity between the two questionnaires, these questions were dropped.

To enable a question about value for money, it was necessary to ask the respondent to rate the price they paid against the service that they received.

One or two questions were re-worded so as to keep the same meaning, but to make them more understandable to a British respondent and possibly simpler for self-completion.

For ease of completion, the questionnaire was split into three different sections:

- the university
- the cafeteria
- an ideal world

- **Section A - The University**

This section asked general questions about the university overall. In future questionnaires, this section will only be included if the questionnaire is asking about a particular service provided by an organisation. The questions it included asked about expectations, quality and customer satisfaction. The questions asked in this section were not used in the index calculation.

- **Section B - The Cafeteria**

This section forms the main part of the questionnaire. Questions are asked about all the different dimensions of the index and it is from this section and one question of Section C that the index is calculated.

- **Section C - An Ideal World**

This section asks the respondent to compare the service that they are using with how they imagine the same service would be run in an ideal world. This gives an indication of the gap that exists between the service as it is now, and the service that the respondent would like to have. Two questions were included in this section one regarding the service in question and the other regarding the university overall. Only the question, which asked about the service (cafeteria or library), was included for analysis purposes.

Changing the three section format

The format of splitting the questionnaire into three sections was only used for this first questionnaire. For subsequent surveys the questionnaire had one section. The reason for this was that in the case of the cafeteria and library surveys, both the cafeteria and libraries are sub services of the university. In the case of the other surveys, the survey was aimed to ask about the entire organisation and, therefore, it was not necessary to split the questionnaire into sections.

South Yorkshire Police, 1997

This questionnaire was the first questionnaire to be mailed to the general public. Included with the questionnaire was a covering letter and an explanation sheet on how to complete the questionnaire. These are explained in more detail later in this chapter.

The police questionnaire also had one filter question and a section for personal details at the end.

The police questionnaire was asked of victims of two different types of crime, burglary and car crime. In order to differentiate between the two, the questionnaires were printed on different colours of paper.

The Yorkshire Purchasing Organisation

This survey gave the opportunity to ask the questionnaire of customers of an organisation, which although public by definition, operates like a private profit making company.

A number of different changes were made to his questionnaire firstly the inclusion of questions regarding repeat purchase likelihood. From the police questionnaire the statistics showed that the data generated by one of the expectation questions was not fitting the model, therefore, the opportunity was taken to try a new question.

The Third World Congress of Total Quality Management

The World Congress of Total Quality Management is an annual event held at Sheffield Hallam University. The conference includes in its pack of handouts a self-completion questionnaire, which asks the delegates to rate what they thought about the speakers. This, however, does not provide a simple overall figures for how the conference has performed overall, nor does it include the other areas of transport, organisation, catering facilities, general facilities etc. In fact, all the other areas that contribute to making a conference a success or not. Therefore, it was decided to carry out a survey of the delegates with the aim of producing an index score which could then in subsequent years be used as a benchmark for future conferences to be compared against. The questionnaire also provided the organisers with more detailed information about the other aspects of a conference which had previously remained un-surveyed.

The Third World Congress questionnaire, provided a basis for testing a complete new look questionnaire which had undergone a number of updates from the previous questionnaire used both in terms of style and content.

Style Changes

This questionnaire under went major style changes, both in terms of the look and how the respondent was expected to complete the questionnaire. In previous questionnaires whereas the respondent had been expected to circle a number, In this questionnaire the style was changed to include tick boxes, which floated under the ten-point scale.

In addition, it was decided to try and make the questions clearer. To this end, each question or group of questions was enclosed within its own box.

Ordering of questions

In previous questionnaires, the respondent had been taken through their service encounter from their initial expectations, through to their final customer satisfaction and loyalty. In essence, it led the respondent through the questionnaire in a chronological order.

However, through continuing questionnaire design research different people purport to the use of using an overall satisfaction question to ease the respondent in to the questionnaire (Naumann & Giel, 1995). In addition, other examples of general satisfaction questionnaires also seemed to point in this direction (Shangri La Hotel Questionnaire, 1998). Therefore, the ordering was changed slightly.

Following the question regarding overall customer satisfaction, the former approach of taking the respondent through the service encounter was maintained.

Asking specific questions

It had been identified through the previous studies that there was a problem with some questions not being specific enough. For example, questions were asking what the respondent thought about the staff of an organisation in general. This was acceptable, but it did not show which areas of staff were performing better or worse. Therefore, it was decided to split down questions to ask about the different areas of staff activities, thus changing questions from a macro perspective to a micro perspective.

This would also allow a drop in a dimensions total to be further investigated to see which part of a dimension (in this case staff) was causing the drop (or increase), and thus allowing the surveyed organisation to be able to do something about it.

While the original question might have been for the staff in general, it also asked the respondent to think in terms of more than one-service criteria. Therefore, the question was changed to include a number of different questions within a set down framework, which would be easier to understand and complete. These modifications also required a change to be made in the presentation of the questionnaire.

Although this adds a lot of questions to the data set this is not a problem, as the questions can be collapsed down into one or more different collections of questions for the Structural Equation Modelling (SEM). One of the major advantages that this approach brings, however, is the ability to see which part of the hotel experience is providing service that is either good or bad in comparison to the other services the hotel provides. Thus, not allowing one area of poor

service to reflect badly on the whole organisation.

An example of splitting a question into sub-parts

If one question covers three service areas, and a customer feels aggrieved about one of them, they are likely to mark the question down i.e. the question might ask, 'How would you rate the service that you received?' The customer might have had a problem with the reception and therefore award the question a '3'.

However, if the question had asked about the different services separately, the respondent is more likely to express his dissatisfaction with the bad service, while giving a more accurate account of the other services experienced:

Quality of Speakers	'7'
Cafeteria	'8'
Reception	'3'
etc.	

It can be seen that the different areas would be treated according to how good or not so good a customer thought each one was. The questions can then be collapsed back down to one score before entering the data into the SEM. Thus, in this particular case the customer would have awarded the hotel '6', for this particular collection of questions.

A further benefit that arises from this approach is that of non-response. If the questions are being grouped together and an average used, the missing values no longer creates a problem, as the averaging process will rectify and take it into account.

The measured areas are agreed with the organisation in question before the survey is carried out to ensure that all the service areas are covered. This therefore makes the questionnaire far more specific to the organisation in question but without losing the generic nature that is required for cross organisation and industry comparisons.

If the questionnaire was being used for an organisation which only had a limited number of services that the customer came into contact with, the list would be shortened accordingly, but would not affect the model due to the questions being collapsed before entering the SEM.

The new look to the questionnaire worked fine as can be seen from the results in '*Chapter 7 - Private Sector Case Studies*'.

South Yorkshire Police, 1998

The second South Yorkshire Police (SYP) questionnaire adopted the same style as the TQM study. However, the 1998 questionnaire had a number of different content changes to the questionnaire, which was used, in the 1997 survey.

Firstly, the questions, which only related to the Association of Chief Police Officers (ACPO) indicators and were not used in the calculation of the model were removed. Secondly, some of the questions, which previously asked for a 'number', were changed to Yes \ No type questions in an attempt to improve the fit of the data to the model and to improve the response rate of particular questions.

For example, during the course of the study questions like:

'In the last year, how many times have you received service from SYP with which you have been pleased?'

where the respondent was expected to enter a number in a box, were replaced with questions similar to:

In the last year, have you received service from SYP with which you have been pleased?

☐

Yes

☐

No

By changing the question to this type, also had the added benefit of being able to use the question in the ACSI formula calculations which is important if an index score is to be calculated for each of the different dimensions.

The Fourth World Congress for Total Quality Management (1999)

This questionnaire was very similar to the one used in the 1998 study. However, some areas were found lacking in the previous questionnaire and these were corrected in the 1999 study.

The Yes \ No questions where possible were phased out and replaced with sliding scale questions. The actual meaning of the question remained unchanged, but it allowed a rating based on likelihood of recommendation rather than a straight yes or no. This was beneficial because the Partial Least Squares (PLS) methodology and the ACSI equations, sometimes produce out of range index scores for dimensions which involve yes \ no variables.

Other Questionnaires

During the course of the study, other questionnaires were also created for other organisations, which showed interest in the study. Unfortunately, these questionnaires were never actually used on a live survey, but did prove useful in proving that it was a fairly straightforward procedure to produce the questionnaires for other types of organisation.

The European Index

The European Union has specified that it would like a customer satisfaction index to be carried out its member states. To this end, a European model (see '*Chapter 4 - Model Development, Validation, Data Analysis*', for more details) and set of questionnaires ('*Chapter 3 - Methodology - A Customer Satisfaction Index*') have been developed. Although I was not involved in creation of the original set of European questionnaires, I was able to influence the content of the questionnaires before the pilot studies were carried out in the various countries. To this end, looking at the European questionnaires proved immensely valuable, as it allowed me to focus on the private as well as public sector. It also became clear that the generic parts of the questionnaire needed to be fairly rigid so that comparisons across industries could be undertaken.

To this end the approach of classifying the questions into three categories for each dimension (on the driver side of the model, (expectations, quality, image, value) was taken. The three categories used were:

- Customisation
- Fitness for purpose
- Reliability

This approach returned the questionnaire to one with a macro outlook, rather than asking the questions at a micro level and collapsing back to the macro level.

- **Customisation**

This category asks the respondent, with regard to the driver dimensions, how much a particular service has being tailored to benefit the customers.

- **Fitness for purpose**

This category asks if the service provided, with regard to the driver dimensions, is suitable for its intended use.

- **Reliability**

This category asks, with regard to the driver dimensions, if the organisation is dependable to do what they said they were going to do.

Problems with the quality dimension

The European Model for measuring customer satisfaction split the dimension of quality into two separate dimensions, soft and hard quality. The hard quality dimension looks at the hard aspects of quality that a customer comes into contact with. These might be the layout of a supermarket, the decor or colour of decor in a supermarket etc., or it might be how accurately the cash machine at the bank dispenses its cash. These are all examples of hard quality, and as such questions are asked of the respondent which cover these particular issues.

However, for some organisations the issue of hard quality is far more difficult for the customer to measure due to the nature of the product or service provided. In the case of the police (see '*Chapter 5 – An Empirical Study of the Public Sector Data*'), many of their customers have not actually used the hard aspects of the service. The respondent's interaction with the police was nearly all based on the soft issues relating to quality. Therefore, questions regarding to the hard issues of quality were not asked in the South Yorkshire Police (SYP) 1998 survey.

Likewise, there are other service areas where the asking of hard questions can become more difficult, if not for all of the categories (customisation, fitness for purpose, reliability) but for some. The telecommunications industry is one such area, along with the other utilities. A reliability of supply question can be asked, but ones regarding customisation and fitness for purpose are more difficult. If only one question feeds into a dimension the weight will always be '1', which therefore means, that the SEM is not having an effect on the dimension that it might otherwise have (see '*Chapter 3 - Methodology - A Customer Satisfaction Index*' for more details).

Covering Letter

A letter accompanied all the questionnaires that were sent out. The letter explained the purpose of the study, highlighting that it was part of a research project and that the organisation, which the questionnaire was asking about, was collaborating in the research.

It also supplied the respondent with full contact details so that any enquiries \ problems that they might have could be fully answered.

Explanation Sheet

In order to make the questionnaire as easy to complete as possible an instruction sheet was included with the questionnaire. This gave instruction on how to complete each of the different types of question that had been included, with an example of a successfully completed question. The different types of questions that have been included in the questionnaires are:

- sliding scale (the sheet pointed out that only one number should be circled or ticked)
- questions that asked for a number
- yes \ no
- questions that asked for comments (these questions were used solely for further information purposes for the organisation which was been surveyed, and were not used in any way for the model calculations.

As the style of the questionnaire changed over the life of the project the explanation sheet was also altered to mirror these changes.

3.9 Conclusion

While the people who produce customer satisfaction indices in America and Europe use the PLS methodology in calculating their index scores, I have found additional benefit in using the AMOS package as a complement. The goodness of fit statistics that the AMOS package provides are useful in deciding whether or not a model is suitable or not. Added to this is the ability to be able to add or remove variables and latent variables with ease to see if any additional benefits can be achieved. Therefore, by using the two packages in tandem the index scores can be calculated while advancing the overall suitability of the technique for measuring customer satisfaction.

However, while the AMOS package is useful as a complement to the PLS, the index calculations are all concentrated on the PLS estimates. It should be noted that the AMOS package requires data that is normally distributed. However, the data generated by the surveys carried out in the case study were generally non-normal, with skewing occurring in a number of the questions. For more diagrammatical evidence of the distributions please see the appendices which show the results of individual questions in each case study.

As the measuring part of the survey process the questionnaire is obviously very important, because without accurate data the results produced by the modelling process are worthless. To this end the questionnaire development had always been treated as an important part of the overall project and has been researched and developed concurrently with the other parts of the research.

It is important to note that while there is a core of questions, which need to be asked in order to generate the index totals, it is also possible to add other questions as requested by the surveyed organisation. These additional questions might or might not be related to the measurement of customer satisfaction.

This Chapter has looked at the benefits of using a micro or macro approach in relation to the questionnaire. However, for the sake of brevity, in calculating the customer satisfaction index only, it will probably be necessary to focus exclusively on the macro approach, unless the surveyed organisation explicitly asks for further information.

**Chapter 4 -
Model Development, Validation, Data Analysis**

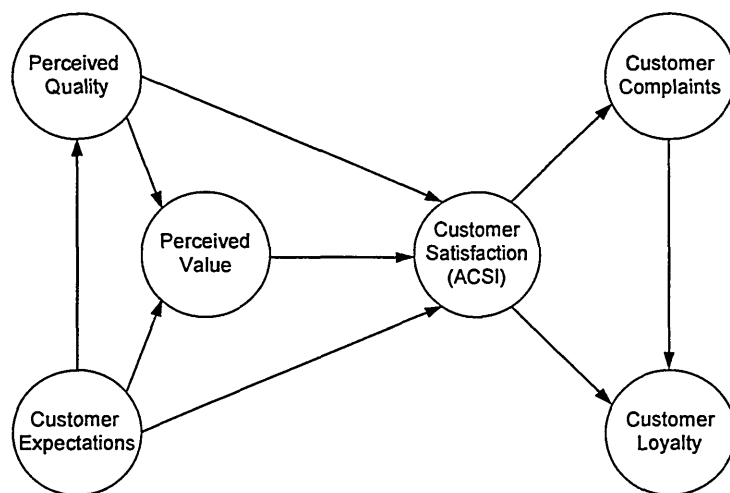
4.1 Introduction

The initial starting point for the model development was Fornell's (1992) American Customer Satisfaction Index (ACSI), or, Swedish Customer Satisfaction Barometer (SCSB). The two models are in fact the same. The first pilot questionnaires for Sheffield Hallam University's Cafeteria Services, South Yorkshire Police (SYP) and the Yorkshire Purchasing Organisation (YPO) were all designed to capture data that could be run through the ACSI model. To this end, the questionnaire (see '*Chapter 3 - Methodology - A Customer Satisfaction Index*') was developed to ask questions on the following dimensions:

- Expectations
- Quality
- Value
- Customer Satisfaction
- Complaints
- Loyalty

As has already been seen in previous chapters, the dimensions were arranged as can be seen in figure 4.1.

Figure 4.1 - The American Customer Satisfaction Index



Fornell, 1992

The ACSI model forms the latent variable structural model that is required. In addition to the model, it is necessary to add the variables, which actually carry out the measuring process. Figure 1, appendix 10, shows the observed variables and how they feed into the SEM. The

actual number of observed variables, which feed each latent variable changes depending on the data set being modelled.

When a data set and model is executed by PLS a number of different statistical results are produced. The next section will look at each of these results and give a brief explanation as to what each one means.

4.2 An explanation of the results

A number of different terms are used throughout the remainder of this chapter. To ease the understanding of the reader, below is a brief explanation of what is meant by some of these terms. These terms are used extensively throughout this chapter and form a basis for justifying or rejecting a particular model or data set.

The Index Values

The index values for the different latent variables are calculated using the outer coefficients that are produced by the PLS (the weights (w_i) for each individual question), the mean (\bar{x}_i) of each individual question and the equation as developed by Fornell (1996).

The Inner Coefficients

The path coefficients that are included on the diagrams (the number on the lines), indicate the amount of influence a change in one latent variables value would have on the next. For example if the coefficient is 0.5, this means that a '1' point raise in the influencing latent variable would lead to a '0.5' point raise in the latent variable being influenced.

The R² Values

The R² value (the bold number above a latent variable), indicates how much effect the model before the latent variable is having on that particular latent variable. For example if the R² value is 0.35, this indicates that the model before this latent variable explains 35% of the latent variable. The ECSI has stated that an R² value greater than 0.65 is required for the model to be viewed as acceptable.

T Values

The T-test (the ratio of the parameter estimate to its estimated standard error) indicates whether individual parameter estimates are statistically different from zero (Fornell & Larcker, 1981). T-values were produced for each of the runs for the model.

The T-value is calculated by:

$$\frac{\text{Inner Coefficient}}{\text{S.D.}}$$

For the T-value to be significant at the 5% level, it needs to have a value greater than 2. The T value is used to indicate which of the following inner coefficients are significant.

Alpha Values

The alpha value is used as a reliability test of the data. The alpha values shows how the different manifest variables that influence a particular latent variable relate to each other. It is also possible to see what the effect on the alpha value would be if one of the questions was removed. This particular test is useful for testing the suitability of different questions and their influence on the model. The alpha value can then be used as a justification for removing a particular question rather than following a trial and error approach in which each question is removed in turn.

4.3 Mapping the Data to the Model

Before the data could be run through the model, it was necessary to first create the lines of code which would allow the PLS programme to run the model and data. Figure 2, appendix 10, shows graphically how the different manifest variables were fed into each of the latent variables.

For the PLS, a small programme had to be written at the end of the SAS.PLS programme. These lines defined how many observed variables were to be fed into each latent variable, the structure of the model (which latent variable fed which other) and the sample size.

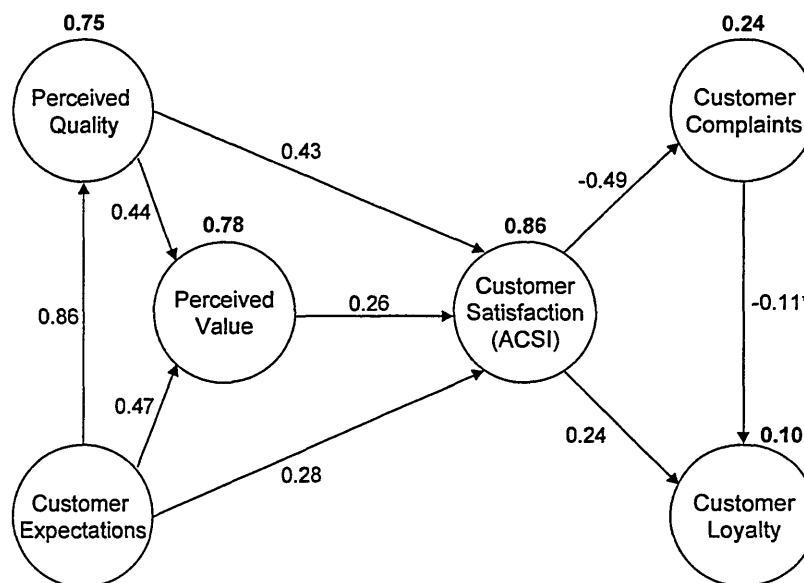
Changes to the model both structurally, and by the removal and addition of other variables, would have effect on the varying statistics that were produced. However, while the changes would have an effect on the outer coefficients as generated by the PLS, the actual effect on the index scores was in most cases insignificant. An area in which the PLS did show changes was in the values it created for the inner coefficients and the R^2 . These would change if variation were made to the model of input (observed) variables.

4.4 The South Yorkshire Police Study, 1997

By running the model through the PLS system, the output that was produced created a table which gave an outer coefficient value (weight, w_i) for each individual question and its place in the latent variable (see table 1, appendix 10). Each weight was between '0' and '1', and as we shall see later, this was used in the calculation process for the overall index scores. The latent variables of Value and Loyalty had weights of exactly '1', this was because there was only one manifest variable feeding each of these latent variables.

As can be seen from the path diagram (figure 4.2), the number explaining the inner coefficients and the R^2 values all seem to be reasonable. Starting at expectations, it can be seen that a large amount of expectation (0.86) influences quality, and that in fact quality can be explained by a 0.75 influence from expectations. Quality has a fairly even influence on the latent variables of value (0.44) and customer satisfaction (0.43). Quality has a fairly even influence on the latent variables of value (0.44) and customer satisfaction (0.43). This could be caused by customers of the police not recognising the concept of value for money when talking about the police, due to the fact that they are not paying directly for SYP's services.

Figure 4.2 - ACSI path diagram, SYP, 1997 data



* Co-efficient which are not significant at the 5% T-Test

The R^2 values for the first part of the model are quite high at 0.75, 0.78 and 0.86 for quality, value and customer satisfaction respectively. However, from this point the R^2 values fall to 0.24 and 0.10 for complaints and loyalty.

The path coefficient from customer satisfaction to complaints is negative -0.49. This means that an increase in customer satisfaction will lead to a fall in complaints, and likewise the path coefficient from complaints to loyalty is negative (-0.11), which means that a rise in complaints will lead to a fall in customer loyalty. Both of these statements seem reasonable.

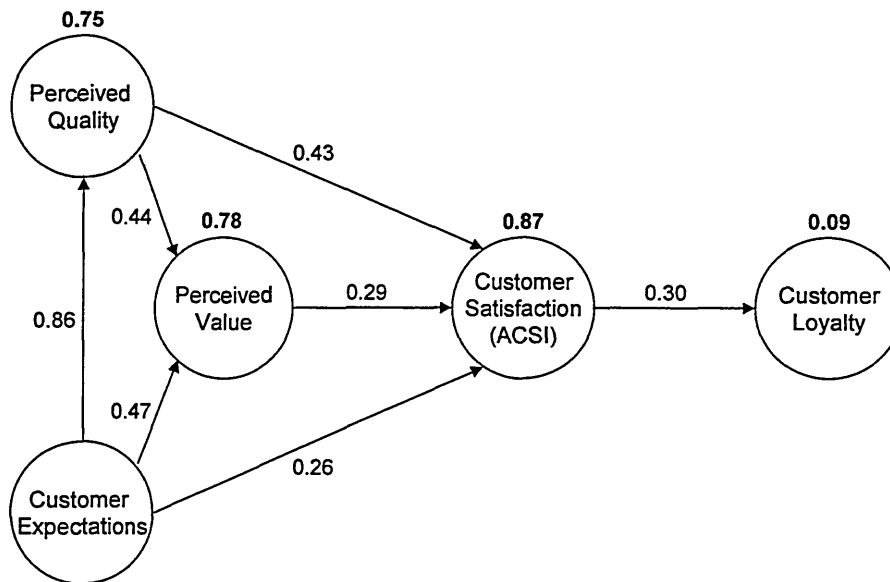
After completing the ACSI analysis of the South Yorkshire Police data, the effect of removing the latent variable of complaints was considered. This altered the look of the model to what can be seen below. It was named 'The Sheffield Model' (Gorst et al., (1998).

The Sheffield Model

As has already been mentioned in 'Chapter 3 - Methodology - A Customer Satisfaction Index', the Sheffield Model (Gorst et. al. 1998) was created to look at the problem associated with modelling customer satisfaction but without the burden of complaints. While complaints is an important part of the overall process of satisfying customers, including it as a dimension in a model creates a number of different problems. The biggest problem is that the number of people actually complaining is always a small percentage of the overall sample, and therefore the actual numbers complaining are small, thus making the index score insignificant. Therefore, the questions that were used for the dimension of complaints were all based upon whether or not the respondent thought they had cause for complaint and not about how the complaint was handled. By removing the dimension of complaints the structure of the model was changed slightly to the one in figure 4.3.

Sheffield Model Path Diagram

The path diagram for the overall (no questions removed, except for complaints) Sheffield Model (SYP, 1997 data), can be seen in figure 4.3.

Figure 4.3 - The Sheffield Model, path diagram

The first part of the model (up to customer satisfaction) shows very little difference to the path coefficients and R^2 values on the original ACSI model.

By using the T-Test, the path coefficients are all significant at the 5% level.

The Index Scores

A large amount of work has been carried out by Fornell and his team to calculate the accuracy of the index scores. Their research was carried out using the 'Jackknife' approach. The jackknife approach runs the PLS methodology on the data a number of times. Each time the data is run one of the data items is removed. By following this type of approach it is possible to calculate the error of the index. Fornell (1992) has calculated that the index is accurate to ± 1.8 with a sample size of 500. It is anticipated that this sample size requirement will come down as the questionnaires become more accurate in the responses that they are seeking and that a 250 sample size, and possibly less, will be more realistic.

The Index scores for each of the models were calculated and the results can be seen in table 4.1.

Table 4.1 - Index Scores - SYP (1997) Data

Latent Variable	Model		
	ACSI	ACSI minus Q7	Sheffield
Expectations	58.13	58.06	58.13
Quality	74.04	73.45	74.03
Value	55.13	55.13	55.13
Customer Satisfaction	65.94	65.11	65.30
Complaints	81.41	81.03	-
Loyalty	46.88	46.88	46.88

As can be seen the ACSI and Sheffield models produce nearly identical values for the Index Scores. The biggest difference, as might be expected, between the ACSI and the ACSI with Q7 removed, is on the latent variable of quality. The Q7 removed model shows a fall in the index score by 0.59. It is therefore possible to conclude that the removal of Q7 is not significant to the model and its results.

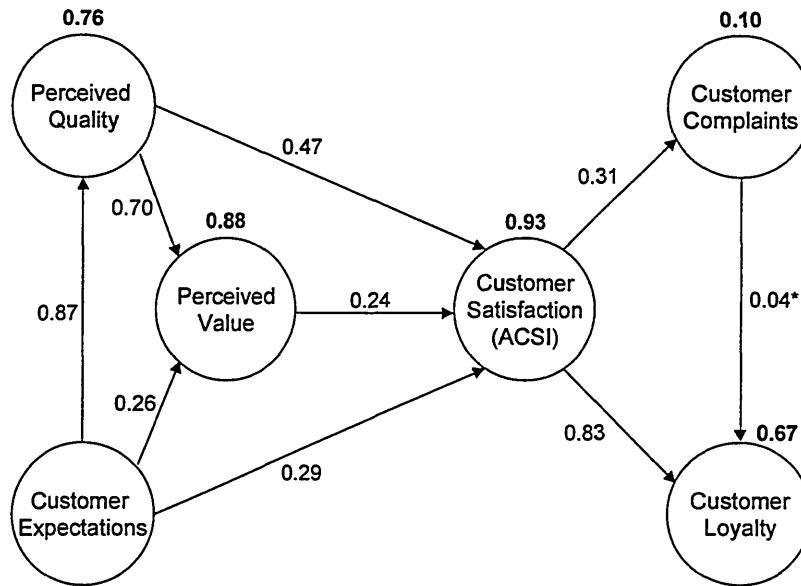
4.5 The Yorkshire Purchasing Organisation

The same type of process that was carried out for South Yorkshire Police was repeated for the Yorkshire Purchasing Organisation (YPO) (see '*Chapter 6 - Public \ Private Sector Case Study*', for a complete breakdown of the results). Starting with the original ACSI model, the questionnaire was mapped on to the model and the various runs were carried out using the PLS methodologies.

As an initial starting point the questions were mapped to each of the latent variables as can be seen in figure 3, appendix 10.

Running the model

The path coefficient diagram can be seen in figure 4.4.

Figure 4.4 - YPO data, path coefficients and R² values

* indicates the paths that are not significant at the 5% t-value level.

The path co-efficient results show some strong links between the various latent variables. The link between expectations and quality, like for the SYP 1997 data is once again very strong. The link from complaints to loyalty is not significant, which is further justification for removing the dimension and swapping to the Sheffield Model (Gorst et. al. 1998). Likewise the R² value for complaints (0.10) is also small. The remaining R² values are all above the 0.65 recommended ECSI cut off point.

Alpha Values

Table 4.2 shows the alpha values for each of the latent variables using the SYP (1997) data set. The table also shows the effect on the alpha value by removing each of the manifest variables in turn.

Table 4.2 - Alpha Values - YPO Data

Latent Variable*	Manifest Variable	Alpha if Manifest Removed	Overall Alpha
Quality	Q3	0.8456	0.8917
	Q4	0.8576	
	Q5	0.8756	
	Q6	0.8795	
	Q7	0.8790	
Value	Q8	-	0.8579
	Q9	-	
Customer Satisfaction	Q11	0.8377	0.8492
	Q16	0.7325	
	Q20	0.7902	

* The latent variables of expectations and complaints do not have an alpha score because they are only fed by one manifest variable. Loyalty has not been included because it was not fed by 10 point sliding scale type manifest variables.

As can be seen in table 4.3 all the latent variables show that there would be no improvement in the alpha value by removing one of the manifest variables.

By removing Q17 and Q19 (the yes \ no questions in the latent variable of loyalty) and running the model with just the sliding scale question, no significant changes to the path coefficients or R^2 values occur.

The path coefficient diagram for the Sheffield Model can be seen in figure 4, appendix 10. All the path coefficients are significant at the 5% T-Test level.

By comparing the Sheffield Model and the ACSI model, most of the path coefficient values and the R^2 values remain the same, which in turn can be backed up the t-values.

Likewise, all the path co-efficients have remained the same.

The Index Scores

Table 4.3 - Index Scores - YPO Data

Latent Variable	Model		
	ACSI	ACSI only Q10 for loyalty	Sheffield
Expectations	75.97	75.97	75.97
Quality	81.67	81.67	81.67
Value	75.50	75.50	75.50
Customer Satisfaction	74.96	74.89	74.92
Complaints	70.83	70.83	-
Loyalty	74.77	87.08	74.69

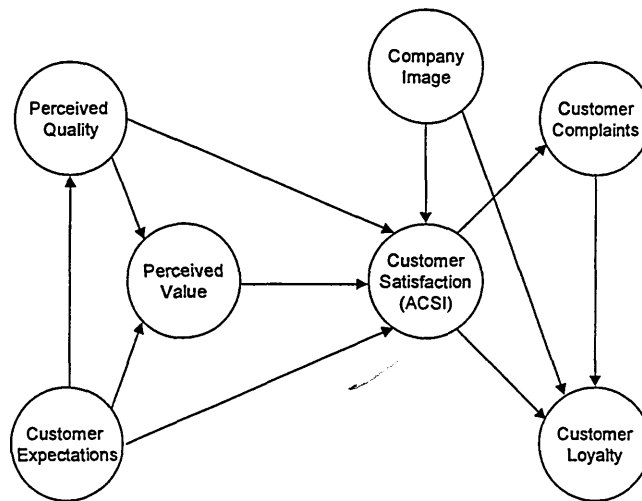
As can be seen from table 4.3, there are no significant changes in the index scores between the ACSI and Sheffield models. For the ACSI with only Q10 for loyalty, the index score for loyalty is significantly improved to 87.08 a rise of over twelve index points.

4.6 The 3rd World Congress for Total Quality Management Study

A number of changes were instigated for this study. Firstly, the questionnaire under went a complete design overhaul, which made the individual questions clearer and easier to self complete (see '*Chapter 3 - Methodology, A Customer Satisfaction Index*', for more details). Secondly, this was the first case study to include questions for a new latent variable, image. The latent variable of image has been included in the European Customer Satisfaction Index (ECSI). To this end, questions about the latent variable of image were included so as to allow tests of the ECSI model to be conducted in a predominantly British Culture. A complete break down of the results for the World Congress can be found in '*Chapter 7 - Private Sector Case Studies*'.

The Dimension of Image

In 1996, Andreassen and Lindestad incorporated the latent variable of Image into the Norwegian Customer Satisfaction Barometer arguing that customer satisfaction is also affected by the image that a particular organisation might have. In addition to his Kristensen & Martensen (1996) also advocate the addition of image as a latent variable which effects the other latent variables of customer satisfaction and loyalty (figure 4.5).

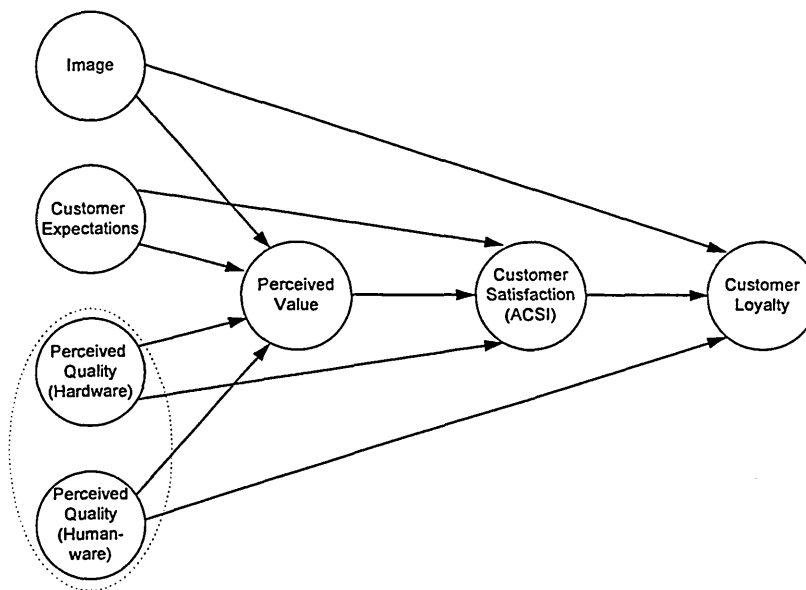
Figure 4.5 - Kristensen & Martensen (1996) working model of customer satisfaction

Kristensen & Martensen (1996)

The European model that is described below also adopted the latent variable of image, but rearranged the paths as to which other latent variables it effected.

The European Model

In 1998, the European Union decided that Europe would have its own Customer Satisfaction Index. To this end a technical committee was set up which developed its own model from the basis of the ACSI. The model that was developed can be seen figure 4.6.

Figure 4.6 - The European Model for measuring customer satisfaction

Kristensen et. al., 1999

As can be seen, The European Model has also dropped the latent variable of 'complaints' but added the latent variable of 'image'. The latent variable of quality has been split into two, hard and soft. Questions that ask about complaints are not included at all in the European model, which gives more weight to the discussion above for the removal of complaints in a future UK index.

Hard quality refers to the physical aspects of a business. These are the buildings and surroundings. If the company were selling a tangible product this would also be covered in this section. Soft Quality, or humanware, refers to the human aspects of the service, or, how the staff members of the organisation treat their customers.

Figure 5, appendix 10, shows how the questions (manifest \ observed variables) for the World Congress, related to the ECSI model. There are far more variables feeding into the model than on previous studies. The diagram shows the model with as many questions included as possible. It is possible to collapse some of the questions down. This was carried out and the results will appear later in this chapter.

Alpha Values

A complete breakdown of the alpha values of the data set can be seen in table 2, appendix 10. The table also shows the effect on the alpha value by removing each of the manifest variables in turn.

If the manifest variables for one of the questions of quality and one of the questions for image were removed, the overall alpha for that particular latent variable would improve. The most significant of these is Q14c of the latent variable of Image. By removing the manifest variables individually no significant improvements were made to the fit of the data to the model. The only significant change that the removal of Q14c brought about was for the index score for loyalty, which by the removal of this manifest variable increased by almost two index points.

The ACSI Model

Figure 6, appendix 10 shows the ACSI model path diagram, with the inner co-efficient values and the R^2 values.

The R^2 values up to customer satisfaction are all above the 0.65 cut off level and therefore seen as been an acceptable representation. The complaints and loyalty R^2 values are below this, which is possibly due to the nature of the questions. Both latent variables include a yes \ no type question.

The Sheffield Model

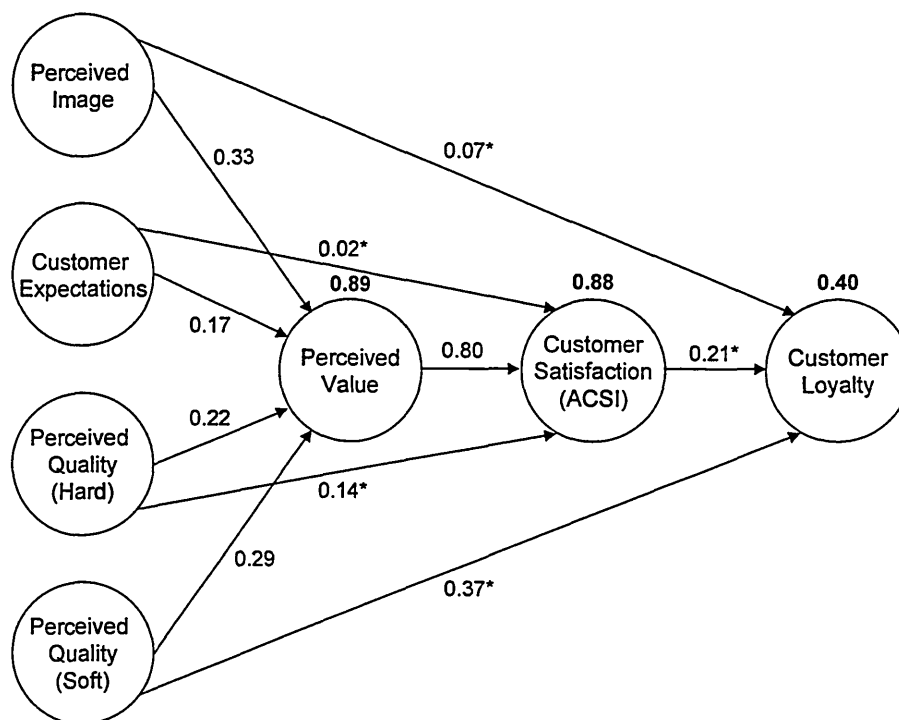
Figure 7, appendix 10 shows the path diagram for the data with the Sheffield model.

The path diagram up to customer satisfaction is very similar to the ACSI model. However, the R^2 value for loyalty is only half the value, indicating that the removal of the latent variable of complaints might well be removing a necessary influence.

The ECSI Model

Figure 4.7 shows the path diagram for the ECSI model.

Figure 4.7 - ECSI model, World Congress data



* indicates paths that are not significant at the 5% t-value level.

Once again the R^2 values up to customer satisfaction are reasonable. The R^2 value for image is roughly half way between the values calculated for the ACS and Sheffield models.

The Index Scores

The index scores for each of the models can be seen in table 4.4.

Table 4.4 - Index Scores

Latent Variable	ACSI	Sheffield	ECSI	ECSI minus Q14c
Expectations	69.65	69.65	69.35	69.34
Soft Quality	72.34	72.34	64.53	64.35
Hard Quality			77.71	77.82
Image	-	-	68.81	68.70
Value	69.14	69.14	69.14	69.14
Customer Satisfaction	62.81	62.79	63.52	63.51
Complaints	83.33	-	-	-
Loyalty	59.12	59.12	59.12	59.12

As can be seen from table 4.4, the amount of variation on the index scores for each of the different models latent variables is very small. The largest variation occurs on the latent variable for loyalty, where an increase in almost two index points has occurred following the removal of a single manifest variable in the image latent variable. Interestingly, the removal of the manifest variable only had a 0.11 effect on the latent variable that is was removed from.

Model Comparisons

The ACSI and Sheffield models both produce very similar path coefficients. Due to the different structures and latent variables, it is more difficult to compare the ECSI model. However, the R^2 value for customer satisfaction is slightly higher. One other point worth noting is that the two paths from expectations are both very small, and show that a change in customer expectations has little or not effect on the dimensions of value and customer satisfaction.

The part of the Sheffield Model that is the same as the ACSI model (up to customer satisfaction) has produced t-test results which are very comparable.

The significant t-test results, mirror the larger inner coefficient values.

4.7 South Yorkshire Police, 1998, Part 12

SYP data overall

The SYP 1998 survey gave a further opportunity for not only comparing the three models, but also to see what difference a larger sample size would make to the fit of the data to the model.

The 1998 study was broken down into three different sections:

Part 1 - Burglaries at addresses identified as being non-domestic between July and August 1998.

Part 2 - Burglaries at addresses identified as being non-domestic between August and November 1998.

Part 3 - Burglaries at addresses identified as being of unknown origin between August and November 1998.

Due to the unknowns associated for Part 3, these results were analysed separately. For a full break down of the results of the 1998 SYP survey see '*Chapter 5 - An Empirical Study of the Public Sector Data*'. This section will therefore look at the data, SYP 1998 Part12, while the next section (4.9) will look at the data, SYP 1998 Part3.

The sample size for this study was 164.

Alpha Values

Table 3, appendix 10 shows the alpha values for each of the latent variables using the SYP (1998) Part 12 data set. The table also shows the effect on the alpha value by removing each of the manifest variables in turn.

There are two latent variables, which would see an improvement in their alpha value if one of their manifest variables is removed. The effects of removing these manifest variables can be seen later in this chapter.

The ACSI Model

Figure 8, appendix 10, shows the path co-efficient diagram for the ACSI model.

As in previous studies the R^2 values are all reasonable up to the latent variable for customer satisfaction. The R^2 value for loyalty is probably as low as it is due to the fact that there is only one manifest variable feeding into it, and this is of the yes \ no variety.

The Sheffield Model

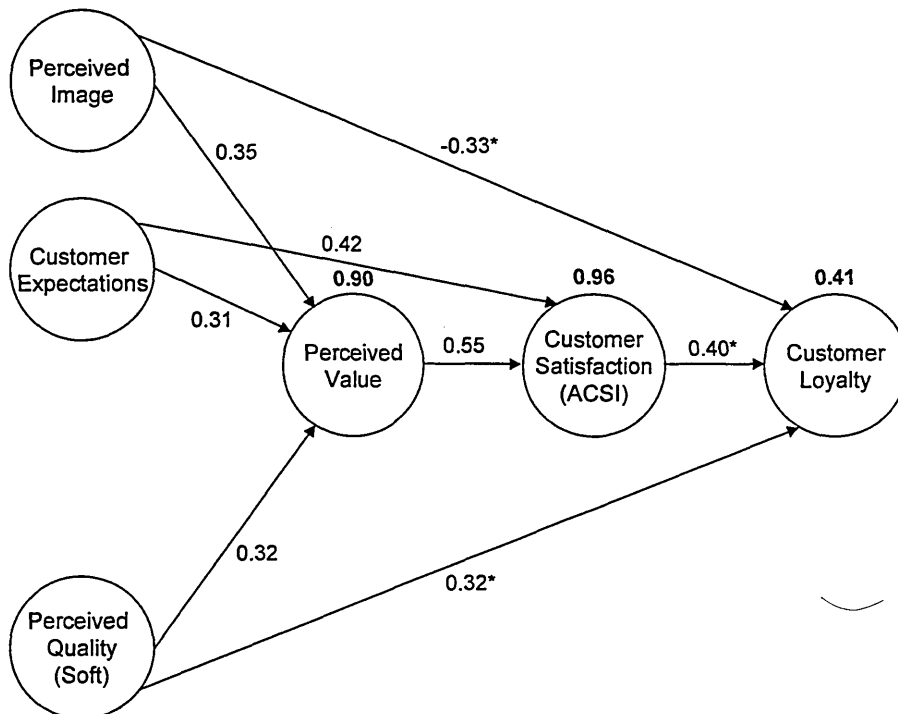
Figure 9, appendix 10, shows the path co-efficient diagram for the Sheffield Model.

As in the ACSI model the path coefficient values and R^2 values are all what would be expected up to and including the customer satisfaction latent variable. After customer satisfaction the R^2 value once again falls off, although the path co-efficient value is 0.59.

The ECSI Model

Figure 4.8 shows the path co-efficient diagram for the ECSI model.

Figure 4.8 - ECSI model, SYP 1998 data



* indicates the paths that are not significant at the 5% t-value level.

For the ECSI model it was very difficult to ask questions about the hardware side of the police. To have asked such questions would have involved asking questions about the state of police cars and stations. Therefore, questions about quality concentrated solely on the soft side. This in turn created problems for the ECSI model, which has a dimension of hard quality. For the initial run of the European model this dimension was ignored. Further discussions about this can be found in section, 4.11 *Critique*, later in this chapter.

While the R^2 value for loyalty is still below the required 0.65 cut off point of the model successfully describing loyalty, it is a significant improvement on the scores generated by both the ACSI and Sheffield models.

The Index Scores

Table 4.5 shows the index scores for the different models with the SYP, 1998 data.

Table 4.5 - Index Scores

Latent Variable	ACSI	Sheffield	ECSI
Expectations	65.41	65.43	65.20
Soft Quality	72.91	72.93	69.14
Hard Quality			N \ A
Image	-	-	72.96
Value	55.11	55.11	55.11
Customer Satisfaction	58.91	58.78	58.71
Complaints	79.66	-	-
Loyalty	81.66	81.66	81.66

As can be seen from table 4.8 the different models do not provide any significant changes to the index scores.

Effects of Removing Certain Manifest Variables

In the section referring to Alpha Values above, it was stated that the removal of two different manifest variables would improve the alpha value for its particular latent variable. By working with the ACSI model the following results were achieved.

Table 4.6 shows the effects on the index scores.

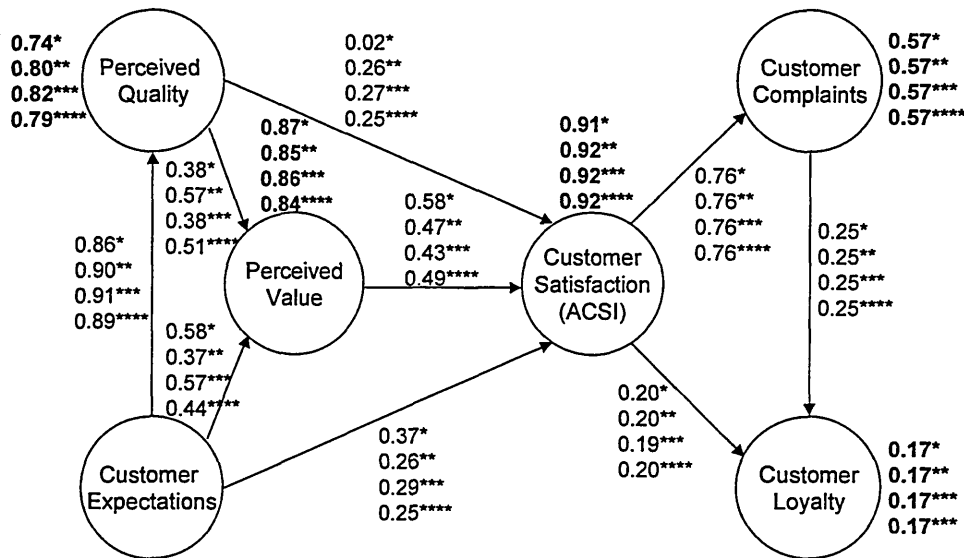
Table 4.6 - The Effect of Removing Manifest Variables

Latent Variable	ACSI (Original)	ACSI No Q2a	ACSI No Q5a	ACSI No Q2a, Q5a
Expectations	65.41	64.53	65.23	64.53
Quality	72.91	68.82	66.87	68.23
Value*	55.11	55.11	55.11	55.11
Customer Satisfaction	58.91	58.67	58.90	58.67
Complaints*	79.66	79.66	79.66	79.66
Loyalty*	81.66	81.66	81.66	81.66

* The index scores for these latent variables do not change because there is only one manifest variable feeding the latent variable.

The removal of Q2a (expectations manifest variable) slightly lowers the index score for expectations, but causes a significant fall in the index score for quality. The removal of Q5a (quality manifest variable) causes little change to the expectations index score, but significantly lowers the index score for quality. The rest of the index scores are relatively unchanged. The removals have no effect on the customer satisfaction index score.

Figure 4.9 shows the effect the removals have on the path coefficients

Figure 4.9 - Removal of Manifest Variables**Key**

- * Original Data
- ** Minus Q2a
- *** Minus Q5a
- **** Minus Q2a and Q5a

As can be seen from the diagram in figure 4.9 the removals have no effect on the model after the latent variable of customer satisfaction.

The R^2 for quality is slightly improved with the removal of the manifest variables. There is also some slight variation on the values of the path coefficients, especially on the path coefficient from quality to customer satisfaction which increase from only 0.02 in the original model to at least 0.25 in the models with a manifest variable removed. The t-test on this particular link also changes to become significant at the 5% level whereas it had previously being insignificant.

4.8 South Yorkshire Police (1998) - Part 3

the data collected on this study used exactly the same questionnaire as for part 12. It could not however be ascertained that the questionnaires went to victims of commercial burglaries, and therefore the data has been kept separate to ensure that all returns were from respondents with as similar outlook as possible.

Alpha Values

Table 4, appendix 10 shows the alpha values for each of the latent variables using the SYP (1998) Part 3 data set. The table also shows the effect on the alpha value by removing each of the manifest variables in turn.

There are two latent variables, which would see an improvement in their alpha value if the manifest variables was removed. The effects of removing these manifest variables can be seen later in this chapter.

The ACSI Model

Figure 10, appendix 10 shows the path co-efficient diagram for the ACSI model.

The path co-efficients and R^2 values are all reasonable up to the customer satisfaction part of the model. Thereafter the R^2 values are quite low.

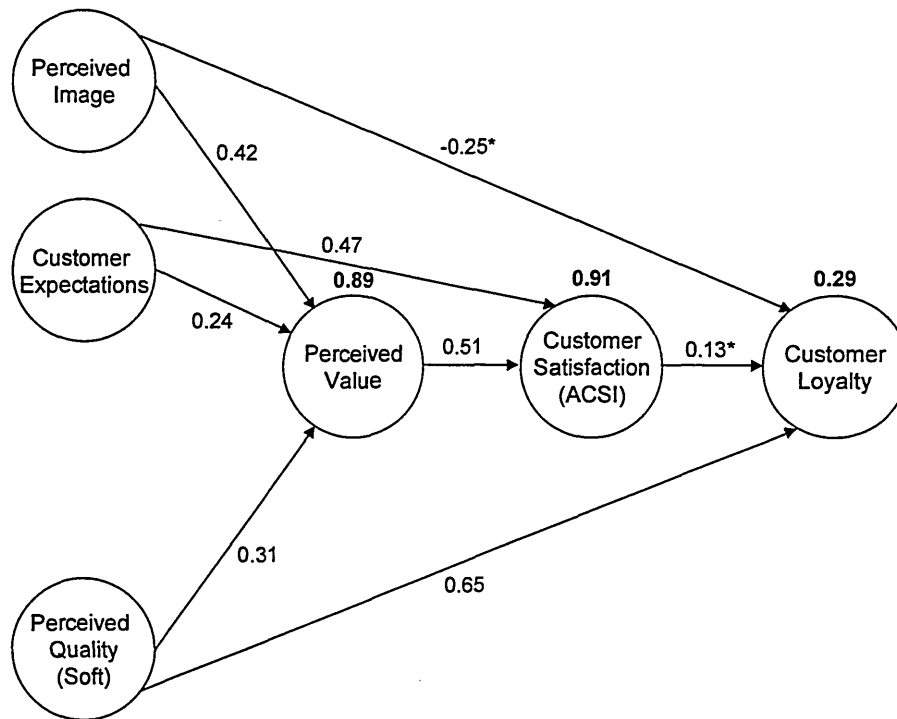
The Sheffield Model

Figure 11, appendix 10 shows the path co-efficient diagram for the Sheffield Model.

The Sheffield model produces results that very similar to the ACSI model. The path co-efficient from customer satisfaction to loyalty has improved, although the R^2 value for loyalty has got worse. Up until customer satisfaction the Sheffield model has produced path co-efficients and R^2 values that are identical with the ACSI.

The ECSI Model

Figure 4.10, shows the path co-efficient diagram for the ECSI model.

Figure 4.10 - ECSI Model, SYP (1998) Data, Part 3

* indicates paths that are not significant at the 5% t-value level.

This model has a negative path co-efficient between image and loyalty. However, the t-test indicates that the path is insignificant at the 5% level.

The Index Scores

Table 4.7 shows how the index scores as calculated by each of the different models.

Table 4.7 - Index Scores

Latent Variable	ACSI	Sheffield	ECSI
Expectations	57.87	57.87	58.18
Soft Quality	69.33	69.33	67.76
Hard Quality			N \ A
Image	-	-	63.21
Value	52.84	52.84	52.84
Customer Satisfaction	54.10	54.07	53.29
Complaints	84.33	-	-
Loyalty	51.55	51.55	51.55

As can be seen from table 4.7, there are no significant differences between the index scores of one model and the others.

Effects of removing manifest variables

In the section referring to Alpha Values above, it was stated that the removal of two different manifest variables would improve the alpha value for its particular latent variable. The full results for the model structure and index scores can be seen in figure 12 and table 5 of appendix 10. The calculations were all carried out using the ACSI model.

By the removal of the two manifest variables, no significant changes are made to the R^2 values. On the whole the path co-efficients also remain fairly static. However, changes do occur, most significantly on the path between quality and customer satisfaction, which besides increasing in size from the original model also become significant at the 5% t-test level. There is also some variation on the paths between expectations and value and the path between quality and value.

The most significant changes occur in the latent variable of quality, where the index score drops from around 69 in the original model to 65 in the model with particular manifest variables removed.

4.9 The 4th World Congress for Total Quality Management

The 4th World Congress presented the opportunity to carry out the survey process and be able to compare the results with the previous years. The questionnaire used was very similar, although some changes had been made which would fill gaps that had been apparent from the previous studies. For a more detailed account of these changes see '*Chapter 3 - Methodology, A Customer Satisfaction Index*'.

Alpha Values

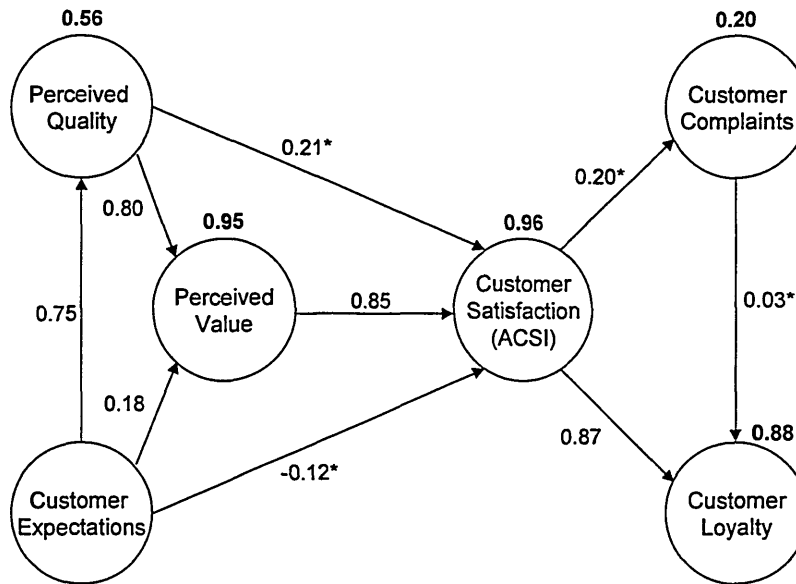
As in previous studies the alpha values for each of the latent variables were calculated to ensure that the data was reliable. Table 6, appendix 10 shows the alpha values for the World Congress 1999 data. The table also shows what the effect of removing each manifest variable in turn would be.

The alpha values overall are acceptable although the value for expectations is quite low, indicating that some more work is possibly required on these questions. There are only two manifest variables whose removal would improve the alpha value of the latent variable. The effects of removing these manifest variables can be seen later in this chapter.

The ACSI Model

Figure 4.11 shows the path co-efficient diagram for the ACSI model.

Figure 4.11 - ACSI Model, World Congress (1999) data



* indicates the paths that are not significant at the 5% t-value level.

The R^2 values for this model are all very good, except for the complaints value. The path from expectations to customer satisfaction is negative, indicating that a rise in the expectations of this sample would lead to a fall in the value for customer satisfaction. The value for this path is small and insignificant and not therefore not a problem.

In terms of the strength of some of the paths, this data provides the strongest paths yet, especially along the following route:

Expectations ➡ Quality ➡ Value ➡ Customer Satisfaction ➡ Loyalty

A further indication that the questionnaire is becoming nearer to asking the correct questions.

The Sheffield Model

Figure 13, appendix 10 shows the path co-efficient diagram for the Sheffield Model.

The values for the path co-efficients are all of the same magnitude as the ACSI model. The R^2 values are all of slightly less value and, except for the value for quality, still well above the 0.65 cut off value.

The ECSI Model

Figure 14, appendix 10 shows the path co-efficient diagram for the ECSI model.

The value from expectations to customer satisfaction is negative. The ECSI model also indicates a negative path between image and loyalty, but again like the expectation \ customer satisfaction path it is small and insignificant.

Of the three paths that link into loyalty, two of them are insignificant, meaning that the majority of the R^2 value for loyalty comes through the customer satisfaction latent variable.

The Index Scores

Table 4.8 shows the overall index scores for each of the models.

Table 4.8 - Index Scores

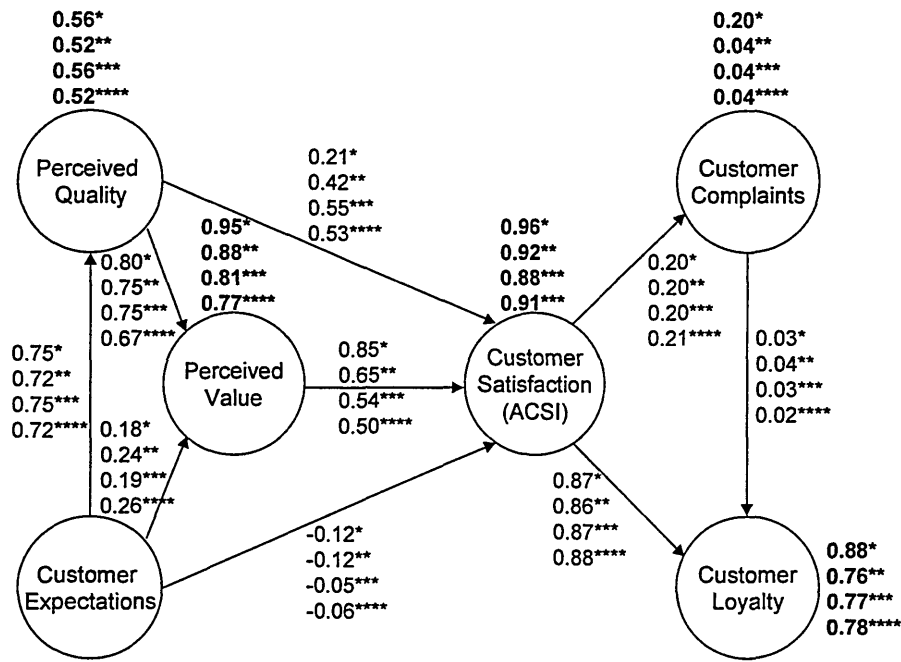
Latent Variable	ACSI	Sheffield	ECSI
Expectations	69.71	69.71	69.43
Soft Quality	64.78	64.78	59.09
Hard Quality			76.77
Image	-	-	64.23
Value	62.26	62.26	63.25
Customer Satisfaction	56.25	56.25	56.13
Complaints	73.63	-	-
Loyalty	57.38	57.39	57.55

As can be seen from table 4.8 regardless of which model is used the customer satisfaction score remains fairly constant with only a 0.12 variation across the three models

Effects of Removing Manifest Variables

In the section referring to Alpha Values above, it was stated that the removal of two different manifest variables would improve the alpha values. By working with the ACSI model the results in figure 4.12 were created.

Figure 4.12 - The Effect of Removing Manifest Variables



Key

- * Original Data
- ** Minus Q2c
- *** Minus Q6a
- **** Minus Q2c and Q6a

The removal of Q2c and Q6a has a number of effects on the path coefficients and the R^2 values. The R^2 values are all slightly lower than for the original data, the biggest drop occurring for the complaints latent variable.

For the path coefficients, the removal of both manifest variables changes the strengths of the influences. The path between quality and customer satisfaction is stronger, while the path between quality \Rightarrow value \Rightarrow customer satisfaction has weakened.

The path between expectations and customer satisfaction while still negative has become smaller.

Table 4.9 shows the effect that the removal of certain manifest variables has on the index scores.

Table 4.9 - The Effect of Removing Manifest Variables

Latent Variable	ACSI (Original)	ACSI No Q2c	ACSI No Q6a	ACSI No Q2c, Q6a
Expectations	69.71	70.48	69.75	70.62
Quality	64.78	71.92	76.79	73.99
Value	62.26	62.85	59.97	59.81
Customer Satisfaction	56.25	56.03	56.21	56.39
Complaints*	73.63	73.63	73.63	73.63
Loyalty	57.63	57.41	57.40	57.42

* The index scores for the complaints do not change because there is only one manifest variable feeding the latent variable.

As can be seen from table 4.9, from customer satisfaction onwards the index values do change by any significant amount. Likewise, for the latent variable of expectations, and to a lesser extent value. However, the latent variable of quality does show some changes, with all three options increasing the index score for quality.

4.10 Comparisons of the same models with different data sets

This section compares the different data sets directly against each other. It compares the models for each of the following:

- Alpha values ✓
- Path co-efficients ✓
- R^2 ✓
- Index Scores

The overall aim of this section is to ascertain which areas of the model are performing in the same manner regardless of the data set, and which areas of the model produce different results, and if appropriate the reasons why.

- **Alpha Values**

Table 4.10 shows the alpha values for each of the different latent variable for each of the different data sets.

Table 4.10 - Alpha values

Latent Variable	Data Set				
	YPO	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Expectations	-	0.8945	0.8071	0.8446	0.6572
Quality (Overall)	0.8917	0.9481	0.8338	0.9007	0.8719
Soft Quality	N/A	0.9329	0.8338	0.9007	0.8308
Hard Quality	N/A	0.9217	N/A	N/A	0.7514
Image	N/A	0.8644	0.8954	0.9049	0.7419
Value	0.8579	-	-	-	0.8059
Customer Satisfaction	0.8492	0.9317	0.9232	0.9318	0.8694
Complaints	-	-	-	-	-
Loyalty	-	-	-	-	0.7645

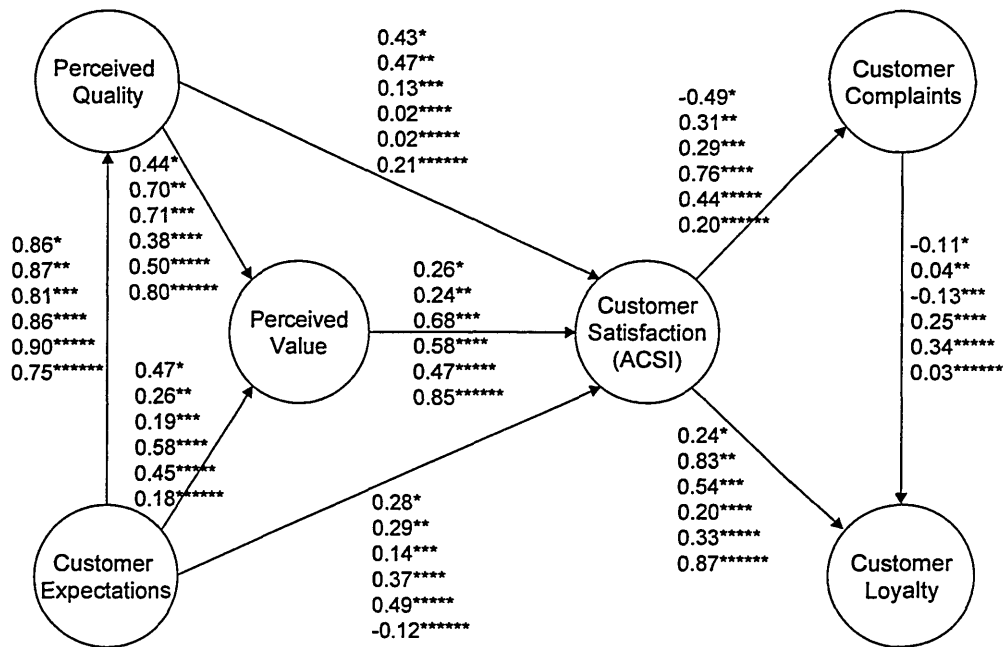
The '-' indicates latent variables for which an alpha value could not be calculated. This was due to only one manifest variable feeding this particular latent variable. For an alpha value to be calculated requires two or more manifest variables.

The only significant alpha value for the latent variable of loyalty comes on the second World Congress case study. This lack in loyalty can be seen all the way through the modelling process, in terms of R^2 values. Problems arose throughout due to failings in the questionnaire, which were corrected in the World Congress (1999) study.

- **The ACSI Model Path Co-Efficients**

As the initial starting point the ACSI model has been run with all the different data sets generated throughout the course of this project. The diagram (although complicated), figure 4.13 and table 4.11, give an idea of how the different data sets influence the same model. All the statistics displayed within this section have been calculated from the initial runs of the data.

Figure 4.13 - Data Comparisons

**Key**

*	SYP (1997)	****	SYP (1998) Part 12
**	YPO	*****	SYP (1998) Part 3
***	World congress (1998)	*****	World Congress (1999)

Some of the path co-efficients seem to be very stable no matter which data set is in used, with roughly the same value being attached to the path. For example, the path between expectations and quality. The path has always has quite a high value, in fact the lowest value is 0.75, and over the six data sets the spread from the highest to the lowest is only 0.15.

Some of the paths seem to have similar values for the data, which was collected from the same source. For example, the path between expectations and value has a fair amount of variation in it (0.29), but the values for the two World Congress data sets return figures that are within 0.01 of each other.

- **R² Values**

Table 4.11 compares the R² values for each of the data sets when run through the ACSI Model.

Table 4.11 - R² Values

Latent Variable	Data Set					
	SYP (1997)	YPO	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Quality	0.75	0.76	0.66	0.74	0.81	0.56
Value	0.78	0.88	0.77	0.87	0.86	0.95
Customer Satisfaction	0.86	0.93	0.82	0.91	0.92	0.96
Complaints	0.24	0.10	0.29	0.57	0.20	0.20
Loyalty	0.10	0.67	0.52	0.17	0.33	0.88

The R² values for the majority of the dimensions are fairly comparable. Every one of the R² values for customer satisfaction is above the 0.65 level as stated by the European Technical Committee (Kristensen et. al., 1999) as being the required threshold. In fact, the lowest customer satisfaction R² value is 0.82 which is 0.17 above.

The worst R² values occur on the latent variable of complaints. This is due to a number of different reasons. Firstly, the manifest variable that feeds into the complaints latent variable is of the yes \ no variety which is not as sensitive as the 10-point scale manifest variables feeding most of the other latent variables. Secondly, in all cases the complaints latent variable is only fed by one manifest variable instead of more than one. Thirdly, the number of people who say that they have had cause for complaint, and actually did, is so small that the manifest variables recording this information have had to be ignored.

Some of the R² values for loyalty have been low, which indicates that the data used so far (except for the World Congress 1999) has not been good enough for the calculation of this part of the model. Problems in the measurement of this latent variable did occur in the early stages of the research, but, the results for the World Congress (1999), seem to indicate that these problems have been overcome, where an R² value of 0.88 was achieved.

- **Index Scores**

Table 4.12 shows the different index scores.

Table 4.12 - Comparison of Index Scores using the ACSI Model

Latent Variable	Data Set					
	SYP (1997)	YPO	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Expectations	58.13	75.97	69.65	65.41	58.87	69.71
Quality	74.04	81.67	72.34	72.91	69.33	64.78
Value	55.13	75.50	69.14	55.11	52.84	62.26
Customer Satisfaction	65.94	74.96	62.18	58.91	54.10	56.25
Complaints	81.41	70.83	83.33	79.66	84.33	73.63
Loyalty	46.88	74.77	59.122	71.44	51.55	57.38

The index scores for each of the different data sets vary by a sometimes, significant margin. This indicates that the organisations surveyed are at different levels when it comes to the level of customer satisfaction that they are providing.

The YPO had the best index scores for every latent variable except for complaints, which produced the worst results of all.

The Sheffield Model

The second of the structured models, the Sheffield Model, was also compared using the different data sets. All the statistics displayed within this section have been calculated from the initial runs of the data.

- **Path Co-Efficients**

Figure 15, appendix 10 shows the overall model including the path co-efficient values.

The path coefficient results are very similar to those produced by the ACSI model. In fact, up to customer satisfaction the path co-efficient values are, for most data sets, identical. The removal of complaints does cause some variation on the link between customer satisfaction and loyalty, which for the majority of the data sets is slight. Where the variation is more than slight, the Sheffield Model shows slight improvement.

- **The R² Values**

Table 7, appendix 10 shows the R² values for each of the data sets when run using the Sheffield Model.

The R² values are also very similar with the value, in most cases, only varying by one or two percent from the figures calculated by the ACSI model.

The World Congress (1998) data sets shows quite a significant decrease, falling from 0.52 in the ACSI Model to 0.26 in the Sheffield Model. The R² values for customer satisfaction are once again all very high and show that customer satisfaction is explained to a large part by the earlier latent variables of the model.

- **Index Scores**

Table 8, appendix 10 compares the index scores for each of the data sets when using the Sheffield Model.

The index scores calculated by using the Sheffield Model, do not differ by any significant amount from those calculated by the ACSI Model. A large number of the individual values are exactly the same as ACSI, while the rest vary by a very small amount (far less than + \ - one index point).

The ECSI Model

The latent variable of image was not asked for the SYP (1997) or YPO case studies. Therefore these two data sets cannot be included in this section.

It should also be noted that the two SYP (1998) data sets did not include the latent variable of hard quality and therefore path co-efficient values with regard to this latent variable can not be included.

- **Path Co-Efficients**

Figure 16, appendix 10 shows the path diagram for the ECSI Model.

A small number of paths co-efficients values are negative. Where these negative values occur the t-test indicates that the path co-efficient is insignificant at the 5% level.

The t-test was calculated for all of the path co-efficients, which in turn indicated if a path was significant at the 5% level. The path between image and loyalty was insignificant for all four data sets.

For most of the paths, the values for the two SYP data sets were roughly comparable, however, the path between soft quality and loyalty showed quite a significant difference (0.32 to 0.65).

A number of the paths had path co-efficient values, which were within a 0.2 band regardless of the data set being used.

- **R² Values**

Table 9, appendix 10 compares the R² values for each of the data sets.

R² values are not calculated for the latent variable of quality as they have been for the other two models because the latent variable which measure quality in this case are exogenous latent variables and R²'s can only be calculated for endogenous latent variables.

The R² values for value and customer satisfaction are well over the required 0.65 limit. However, the R² values for loyalty are once again quite low, except for the last study (World Congress) which produced a value of 0.80.

- **Index Scores**

Table 10, appendix 10 compares the index scores when calculated by the ECSI Model.

The variation on the index scores between the ECSI and the ACSI is greater than the variation between the ACSI and Sheffield, but not significantly.

4.11 Critique

The two dimensions of quality

The problems that occurred with the police data with regard to the two dimensions of quality are not solely related to this service. In fact, they occur for other areas where the service is all that is being provided. Areas such as telecommunications (both land line and mobile) and telephone banking do not have fixed assets that a customer can easily relate to and thus award a score out of ten to..

Likewise, if a customer is rating a product for which they do not use, or very rarely use, for example, the back up service for a breakfast cereal, or most other supermarket products, then

the area of soft quality is very hard to measure. Therefore, it is suggested that the two dimensions of quality are treated as one, although the two sets of questions can still be asked if they are relevant.

Different data sets can have various effects on the R^2 s and path co-efficients that the model produces. Different latent variables have different importance to the respondents at the time of completing the questionnaire. This will therefore have a knock on effect and make some of the path coefficients values strong for one data set but not as strong or almost non-existent for another.

The T-Test Value

The t-test has been used in this chapter as a backup to the inner co-efficient value. However, it is also worth noting some areas when problems can occur with the t-test statistic and its use with structural equation models.

The estimation procedure does not guarantee that the standard errors are reliable (Fornell & Larcker, 1981). Although the computation of standard errors by inverting the Fisher information matrix is less prone to produce unstable estimates than earlier methods, complete reliance on t-tests for hypothesis testing is not advisable (Lee & Jennrich, 1979, Fornell & Larcker, 1981).

A second problem that can occur is that the t-statistic tests the hypothesis that a single parameter is equal to zero. The use of t-tests on parameters understates the overall Type I error rate and multiple comparison procedures must be used (Bielby & Hauser, 1977; Fornell & Larcker, 1981).

The t-test statistic is therefore not used in isolation when testing the validity of a particular structural equation model.

4.12 Conclusion

In conclusion, this chapter has shown two different models as developed by other people, the ACSI model (Fornell et al, 1996) and the ECSI model (ECSI Technical Committee, 1998). In addition the Sheffield model (Gorst et al, 1998) has been included. It is difficult to draw absolute conclusions as to which is the best model, due to each model reacting differently to the different data sets.

The latent variable of image, as used by the ECSI model, is a beneficial addition, and is likely to remain in any subsequent model.

Due to the need for the model to be generic in nature and thus be able to be used over a variety of different companies whether they be in the service or product sectors means that the dimension of quality needs to be maintained as a separate latent variable. While splitting the dimension into the two areas of soft and hard does have its benefits, when further, more in-depth analysis is required, it also causes problems for companies that are exclusively service based and do not have offices that the general public see or visit. Therefore, it would be my recommendation based on the models developed within this chapter that the two dimensions be reconciled as a single latent variable.

Chapter 5 - An Empirical Study of the Public Sector Data

5.1 Introduction

This chapter looks at the case studies which, were carried out in the public sector arena. Two separate surveys were carried out with South Yorkshire Police, the first in 1997 and the second in 1998. The overall objectives of the two surveys were the same, however, the target populations were different.

Background to South Yorkshire Police

South Yorkshire Police (SYP) are keen to provide the best quality service they can through the best use of their budget. Their record of winning the Charter Mark can be seen as an indication of their success. SYP were winners of the inaugural Charter Mark in 1992. The Charter Mark is awarded on a three yearly basis, and SYP have subsequently been awarded the Charter Mark in both 1995 and 1999.

The phrase that accompanies the award is 'Awarded for Excellence'.

SYP have a number of other achievements in the area of quality, some of which can be seen below:

- South Yorkshire Police are members of EFQM and have been since 1994.
- South Yorkshire Police applied for the EQA (European Quality Award) in 1996.
- South Yorkshire Police hosted the first public sector open day on behalf of EFQM in April 1996, and the Quarterly representatives meeting in December 1997.
- South Yorkshire Police are active participants within the EFQM and have contributed to the improved model development as well as a set of police specific guidelines in collaboration with a number of other forces active in this area.
- South Yorkshire Police have two 'open license' holders who offer Assessor training to external organisations, as well as our own staff. There are four members of the Senior Command team who are trained to Assessor level, with the other two being trained in January and February 1999.
- By 1999, South Yorkshire Police will have 5 serving officers who are EQA Assessors, in addition to providing staff as Assessors for the Midlands Excellence Award and the North Eastern Excellence awards process.
- South Yorkshire Police presently have a cross section of approximately 160 members of staff who are trained to assessor level.

(Source: South Yorkshire Police World Wide Web Page)

It is this commitment to offering a quality service that made SYP an appropriate organisation to carry out the index approach with.

5.2 The Dimensions, as they refer to SYP

The two data sets within this case study were analysed using a number of different models. The 1997 data was initially analysed using only the ACSI model. However, through this study a second model, the Sheffield Model, was developed. More details about the results of this can be seen in, '*Chapter 4 - Model Development \ Validation \ Data Analysis*'.

The second study in 1998 was analysed using the ACSI and Sheffield models, and also the European Customer Satisfaction Model (ECSI). The ECSI model, unlike the other two models includes the dimension of 'Image'.

The ECSI model could not be run in its entirety due to the nature of the questionnaire. The questionnaire was looking specifically at the service the police provide, and therefore questions relating to 'Hard Quality' were not included. This dimension is therefore missing from these explanations.

Expectations

In general, most people do not have much contact with the police other than seeing them in the street. Therefore, people's expectations of the police are often formed by what they have been told by other people or have seen in the media. This information can therefore be second hand, third hand or even worse. Therefore, expectations are not always likely to be high or low.

Perceived Quality (soft)

The area of quality and the police can be quite controversial. If we were to look at the police's work in purely black and white terms it could be said that they are not providing a quality service because if they were they would catch all the criminals and recover the stolen property etc. However, we do not live in a black and white world and the perception of what is a quality service and what isn't can vary greatly from one person to another. To try and get an accurate picture of this the area has been split down into as many sub-sections as possible, with questions being asked about how the telephone call was handled, how the desk enquiry was handled and how the attending police officer treated them.

Perceived Value

Due to the fact that people do not pay directly for the police service that they receive, it is difficult to ask value questions. However, by relating the question to the amount of their council tax that goes towards the police force I was able to some extent to get around this problem.

Image

The image of the police as perceived by the general public is an important area. The questionnaire asked the respondent what they thought about SYP in terms of honesty, professionalism and friendliness.

Customer Satisfaction

Customer satisfaction is a term that many people perhaps have trouble identifying themselves with, when talking about the police. People in general do not classify themselves as being customers of the police. Other words such as victim and the accused are probably more associated with the police.

Complaints

As the different models have progressed over time, there has been evidence that maybe complaints should not be included in the model (due to the small number of people who have actual experience of complaining). However, in order to be able to carry out comparisons of the different models, it was still a required dimension. The different complaint questions were included, but only one of these questions could actually be included for analysis purposes due to the small number of people who have actually complained.

Loyalty

The concept that a person is loyal to the police can at times be quite difficult to understand. Many people argue that they have no choice in using the police for the majority of their services and therefore they are not loyal, but use them out of the simple necessity that no one else can help. However, it is possible to measure loyalty to some extent by whether or not the respondent defends the police or tells everyone about a bad experience.

5.3 Survey 1, South Yorkshire Police 1997

Increasingly, customer satisfaction is becoming an aspect that the police must keep an account of. Therefore, to aid the police, an ACSI type questionnaire was developed. The questionnaire also included questions which covered the different aspects that the police are required to submit to the Home Office and the Association of Chief Police Officers (ACPO).

The ACPO indicators require the following to be measured:

- Level of satisfaction with foot and mobile patrols

and the happiness with speed of police response and the satisfaction level with how the incident was handled for the following areas of police activities:

- Police action in response to 999 calls
- Enquiry Counters
- Burglary
- Violent Crime
- Road Traffic Accidents

Survey Methodology

The questionnaire was sent to people who had had a recent interaction with South Yorkshire Police. The people fell into one of four different categories, they were either:

- | | | |
|---|---|--------------------|
| • a victim of burglary in district 'H' | - | 113 questionnaires |
| • a victim of car crime in district 'H' | - | 112 questionnaires |
| • a victim of burglary in district 'J' | - | 113 questionnaires |
| • a victim of car crime in district 'J' | - | 112 questionnaires |

To try and keep the returns from as like minded people as possible all the questionnaires were sent to people from the same ethnic background. In this case these were people who classed themselves as being white.

Initially, the questionnaire was sent to 300 different addresses, 150 to each of the two categories. After a period of approximately 3 weeks, a reminder letter was sent to the people who had not responded. 129 questionnaires were returned with a response rate of 43%. Due to

the nature of how the proposed analysis method, Partial Least Squares (PLS), works this was deemed to be too few. Therefore, a second survey was sent to a further 150 people, again evenly split between the two categories. Due to logistical problems it was not possible to send a reminder to these people. The response rate for this second survey was 24%.

Overall the response rate was 37%.

For a complete breakdown by question of the results and distributions for each question, please see appendix 12.

For more details about the questionnaire, please see '*Chapter 3 - Methodology - A Customer Satisfaction Index*'.

Analysis

A number of different analyses were carried out on the data, as can be seen below.

Statistical break down of respondents

A breakdown of the different types of respondent was carried out so as to see if there was any difference in how the demographic that a person was from effected how they rated customer satisfaction.

Response by district

Table 5.1 shows the breakdown of how the questionnaires were returned in accordance with each of the different districts and crime classifications.

Table 5.1 - Break down of returned questionnaires

	H	J	Total
Burglary	41	46	87
Car Crime	39	38	77
Total	80	84	164

Age of respondents

Figure 5.1 shows the break down of respondents by age group for the two categories of crime:

Figure 5.1 - Percentage response by age group

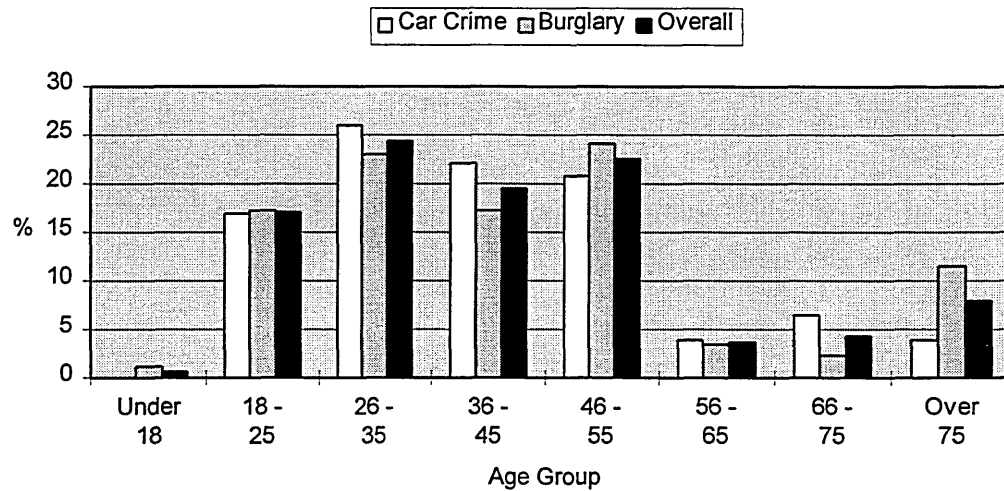
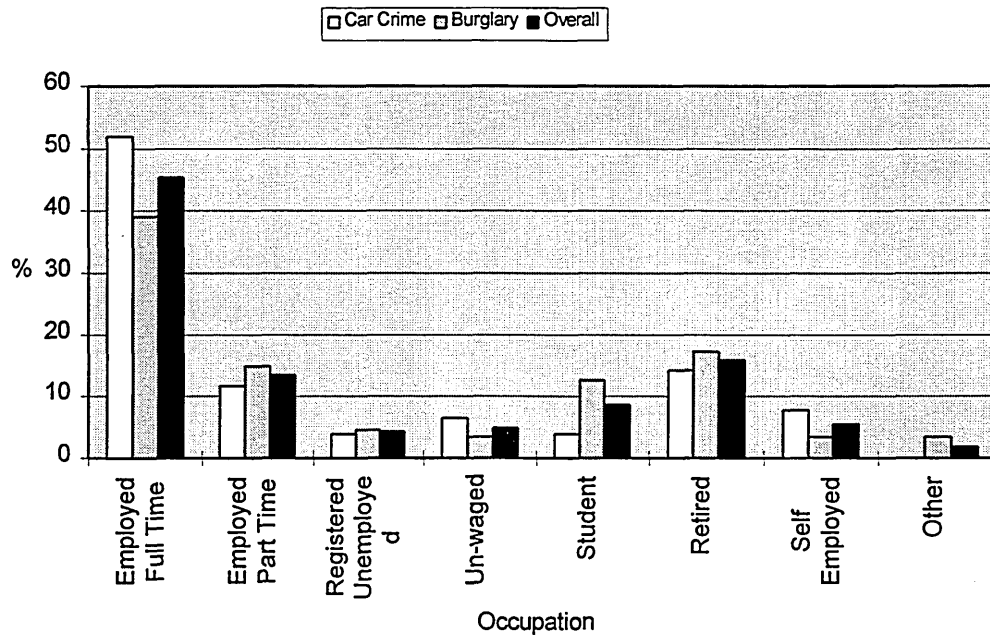


Table 1 in appendix 11 shows the actual numbers in terms of percentages.

Employment status of respondents

Figure 5.2 shows the responses by employment status.

Figure 5.2 - Percentage response by employment status



One non-response.

Data collection

A number of different question types were used to collect the data. These fell into two distinct categories, questions that used a 10-point sliding scale, and those that didn't.

Types of Analysis

Varying types of analysis have been carried out on the data ranging from basic histograms to show the spread of the responses for each individual question, to more complicated techniques like factor analysis. In addition to these, the data was subjected to a methodology called 'Structural Equation Modelling' (SEM). This methodology was carried out using Partial Least Squares (PLS). The PLS methodology is used by the team that carries out the American Customer Satisfaction Index (ACSI). For a more detailed explanation please see '*Chapter 3 - Methodology - A Customer Satisfaction Index*'.

Making contact with the police

Question 8) was a filter question which asked the respondent to state how they had initially made contact with the police. Table 5.2 shows how this was achieved:

Table 5.2 - How respondents made contact with South Yorkshire Police

	%
Dial 999	20.7
Phone, but not 999	60.4
Call in at a police station	4.3
Approach an officer	1.2
Other (Details requested)	4.9
Non-Response	8.5

Some of the people, who circled 'Other', indicated that a neighbour made the initial report to the police.

Less than satisfied customers

Question 17) asked the respondent how many times they had been less than satisfied with SYP services. 73.8% of people indicated that they had not been less than satisfied over the previous year. Table 5.3 shows the frequency with which people had been less than satisfied:

Table 5.3 - Less than satisfied respondents

Number of people who had been less than satisfied (in the last year)	% of total respondents
never	73.8
Once	15.9
twice	3.7
three times	3.7
four times	1.8
five times	0.6
nine times	0.6

Complaints

Question 19) asked respondents to indicate whether or not they had complained when they perceived they had received unsatisfactory service. Of the total number of people who completed the questionnaire, only 4.9% indicated that they had raised their dissatisfaction with the police. This question was not used in calculating the index scores due to the low number of people who completed it.

Questions 20) to 23) asked the respondent to indicate how many times they had received both good and not so good service. The questions also asked the respondent how many other people they had told about their good and not so good experiences. Table 5.4 summarises this information.

Table 5.4 - Number of good or bad service experiences

	% of respondents who had at least one:	% of respondents who told at least one other person about a:
Positive experience	72.0	51.8
Negative experience	11.0	9.8

Results by Question

The results for each individual question can be seen in appendices 4 (SYP, 1997) and 7 (SYP, 1998). The results for all the sliding scale questions have been displayed as histograms, which shows the distribution of the data, and therefore how close or faraway it is from the normal distribution.

Factor Analysis

A factor analysis with a varimax rotation was carried out on the results of the sliding scale questions. The result can be seen in table 5.5.

Table 5.5 - Factor Analysis

	Factor 1	Factor 2	Factor 3	Factor 4
q1	0.5443	-0.03612	-0.09633	0.96351
q2	0.87926	0.27186	0.16675	0.10064
q3	0.87304	0.23531	0.21130	0.02661
q4	0.25337	0.04905	0.90802	-0.20842
q5	0.21786	0.68317	0.58410	0.23216
q6	0.88732	0.02910	0.12682	0.12522
q7	0.59214	0.31189	-0.04851	0.15655
q9	0.05761	0.96768	0.05279	-0.08825
q10	0.60819	0.52646	0.23780	-0.18689
q11	0.45201	0.84078	-0.05164	0.00004
q12	0.91847	0.26252	-0.03264	-0.12762
q13	0.75760	0.01222	0.46173	0.27219
q14	0.94359	0.08114	0.22219	-0.00975
q15	0.94094	0.23131	0.14496	-0.10087
q16	0.95194	0.20399	0.13438	-0.00108
q24	0.88457	0.22975	0.35580	0.02970

VARIMAX converged in 6 iterations.

The process pulled four factors from the data.

Factor 4 - Question 1), which asks the respondent about their expectations falls exclusively into this category. This shows that the respondents treated this expectation question completely separately from the rest of the questionnaire.

Factor 3 - This factor contains question 4) and appears to almost share question 5) with factor 2. These two questions ask the respondent about how satisfied they are with the level of foot and vehicle patrols, and therefore, some link would be expected.

Factor 2 - This factor contains questions 9) and 11) completely and shares question 5) with factor 3 and question 10) with factor 1. Questions 9) and 11) refer to how happy the respondent was with the amount of time it took SYP to answer the call and, was the response time to the call fast or slow. These two questions are very similar and with the backing of the results from the factor analysis, could possibly be amalgamated into one question in a future questionnaire. Question 10) is also partly in this factor and refers to the respondent's satisfaction with the way the call was handled.

Factor 1 - This factor contains everything else that does not fit into one of the other factors.

Index Scores

The index scores presented in this section were all calculated using the Partial Least Squares (PLS) methodology. See '*Chapter 3 - Methodology - A Customer Satisfaction Index*', for an in-depth insight into how the programme works.

The Model

Figure 1, appendix 11 shows how the different questions feed into the original ACSI (Fornell, 1992) model.

By running the data through the ACSI model and the subsequent formula, the overall index score for South Yorkshire Police was calculated as:

66.4

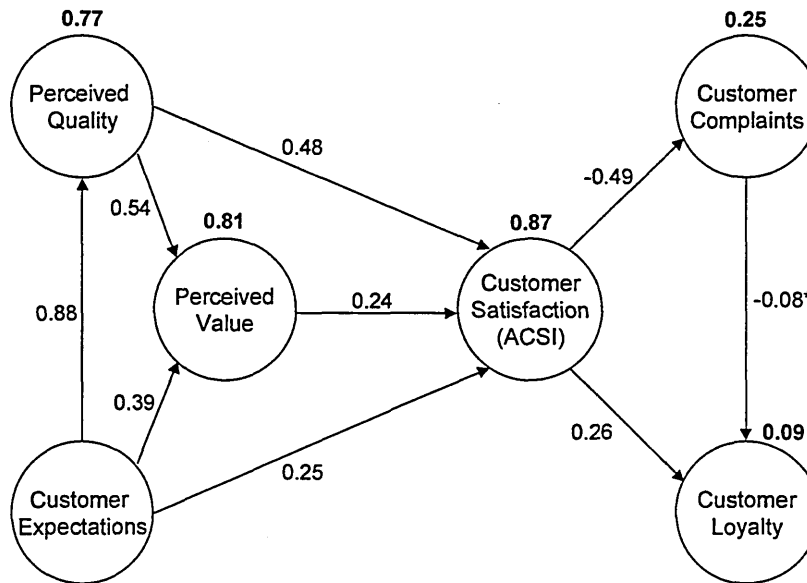
Table 5.6 shows the index scores for each of the dimensions of the model.

Table 5.6 - Index Calculation

Dimension	Index
Expectations	58.8
Quality	73.9
Value	55.8
Customer Satisfaction	66.4
Complaints	82.0
Loyalty	47.8

Therefore, South Yorkshire Police have been measured to have an index value of 66.4 out of 100.

In addition to calculating the index scores, the path co-efficients, and R^2 values were also calculated. These can be seen in figure 5.3. The path co-efficients are the values on the arrows while the R^2 values are the figures in bold above the circles.

Figure 5.3 - Path Co-efficients and R^2 values for SYP 1997

As can be seen from figure 5.3, some of the path co-efficients are stronger than others. This is often due to the number of co-efficients that feed a particular latent variable. The R^2 values up until customer satisfaction are also strong, which indicates that the model up until customer satisfaction is adequately explaining the latent variability of customer satisfaction.

The Sheffield Model

The data was also used to run the Sheffield Model. This produced the results as can be seen in table 5.7, and the comparative index score from ACSI.

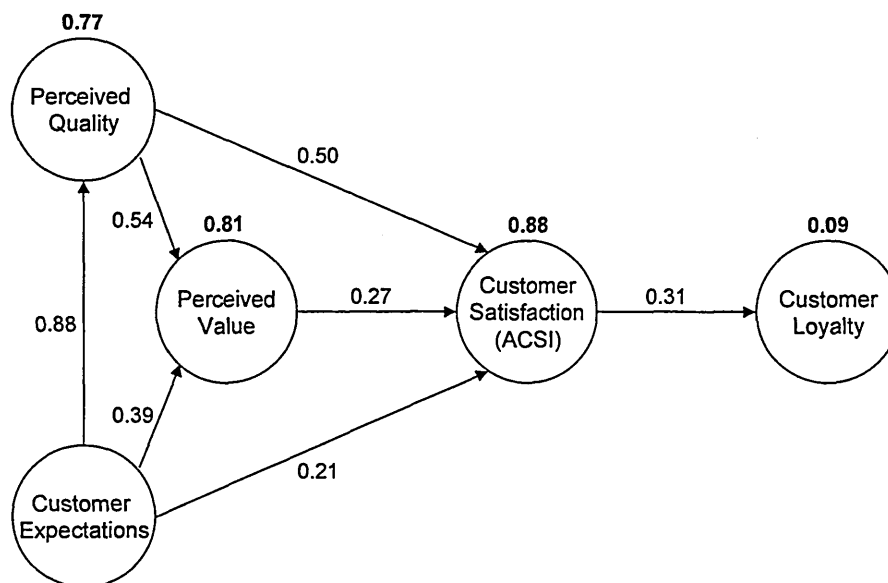
Table 5.7 - The Sheffield Model, Index results

Dimension	Sheffield Scores	ACSI Scores
Expectations	58.8	58.8
Quality	74.3	73.9
Value	55.8	55.8
Customer Satisfaction	66.0	66.4
Complaints	N \ A	82.0
Loyalty	47.8	47.8

The two different models produced index scores, which are very close. There is no significant difference between the index scores produced by the two models.

The data also produced the following path co-efficient diagram (see figure 5.4)

Figure 5.4- The Sheffield Model



As can be seen from figure 5.4 The path co-efficients and R^2 values are very similar to the ACSI model (see figure 5.3).

Breakdowns

The index approach was also used to generate a number of breakdowns within the South Yorkshire Police data.

By Crime

These can be seen in table 5.8. For each of the breakdowns below it should be remembered that the sample size is very low, and that a larger sample size would be preferable before conclusions are drawn from the data. All the index totals below have been calculated using the ACSI model.

Table 5.8 - Index Total by Crime

	Customer Satisfaction Index Score
Burglary	67.1
Car Crime	65.0
Overall	66.4

Table 5.8 shows how well the respondents deemed SYP to have acted when dealing with the incidents of burglary and car crime. As can be seen from the figures, it would seem that SYP gives a slightly higher level of satisfaction to its customers when it is dealing with burglary than car crime. However, the difference is less than two index points and with the associated sample sizes for the burglary and car crime data sets, the difference would not be deemed to be significant.

Figure 2, appendix 11 shows the path co-efficient diagram which compares the two different types of crime.

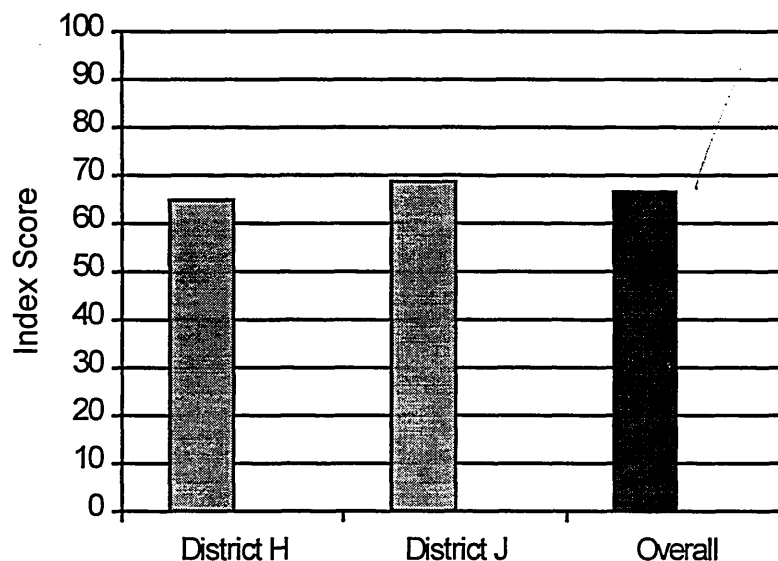
There are a number of differences between the path co-efficients for the two data sets. The path co-efficients for the burglary data set begin more strongly from expectations than the data set for car crime. However, this is reversed in the paths from quality. Both data sets show the path from customer satisfaction to complaints as being negative, while both data sets also show the path from complaints to loyalty as being insignificant at the 5% T-test level.

There are also some differences between the two data sets with regard to the R^2 values. Up until customer satisfaction the R^2 values for car crime are generally lower than those for burglary, however, this changes for the final two latent variables of complaints and loyalty, where the car crime R^2 values are higher.

By District

The data was collected from two different districts of South Yorkshire. The districts, H and J, were defined by SYP and were both in the Sheffield area. The index score for each district can be seen in figure 5.5.

Figure 5.5 - Index Total by District



As can be seen from figure 5.5, the districts that the respondents live in does make a slight difference in the customer satisfaction scores. The difference between the two districts is almost 4 index points.

The path diagram comparing the two districts is found in figure 3, appendix 11.

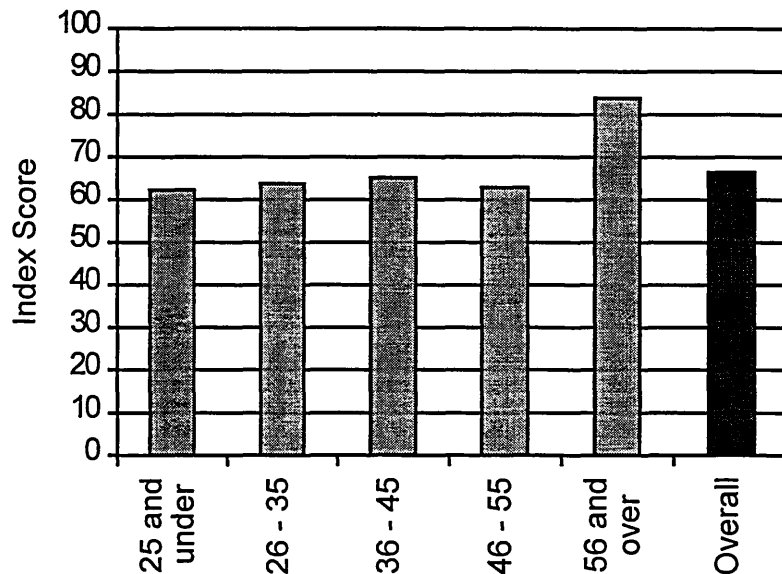
There are some variations in the path co-efficients between the data sets of districts H and J. These are not however, as pronounced as those for the types of crime.

The R^2 values for quality and value are fairly static between the two data sets. There is a slight variation on the value for customer satisfaction, while the variation for complaints is over double.

By Age

Due to the low number of responses the three age groups for people over 56 years of age have been linked together as can be seen in figure 5.6.

Figure 5.6 - Index totals by age of respondents



The highest level of satisfaction would appear to be among the 'Over 55' age group who have a customer satisfaction index score of 83.8, which is almost 20 index points higher than the next highest age group. In fact, the other four age groups are all of a similar score with an average of 63.5 index points

Figure 4, appendix 11 shows the path co-efficient diagram for the breakdown by age.

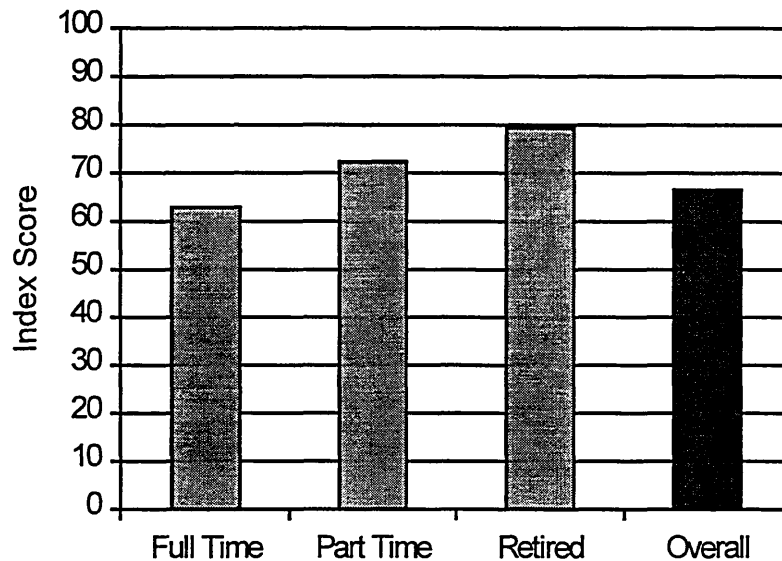
Like for the breakdowns by crime and district, there are some differences in how the data tracks through the model. Some paths are quite weak with one particular data set while the same path might be quite strong with another. One of the most stable paths of this model with both this data set and others is the path between expectations and quality.

The largest variabilities for the R^2 values are on the latent variables of complaints and loyalty, where there is a 0.28 and 0.24 variability respectively.

By Occupation

A number of groups have been left off this graph (figure 5.7), as there was not enough respondents in each category.

Figure 5.7 - Index by occupation



Not surprisingly, the retired people indicate a higher level of satisfaction than the people in employment do. The part time people have a 10 point higher level of satisfaction than the people who indicated that they were in full time employment do.

Figure 5, appendix 11 shows the path co-efficient diagram for the breakdown by occupation.

A significant point of this diagram is the negative values for the retired data set between expectations and value, and, quality and value. These values are not negative for any of the other data sets. However, the value from customer satisfaction to complaints, which is negative for the majority of the other data sets, is positive for the retired data set.

In conjunction with the negative path co-efficients the R^2 value for quality would seem to be lower than has been the norm for the other SYP (1997) data sets, while the R^2 value for complaints is higher than would seem to be the norm for other SYP (1997) data sets.

5.4 Survey 2, South Yorkshire Police, 1998

The 1998 study was completed as a follow up to the survey carried out with South Yorkshire Police (SYP) in 1997. The aim was to generate a data set, which was larger than the previous case studies. This would then allow investigations to take place to see if larger sample sizes would produce more stable results.

After consultation with SYP it was decided to survey victims of burglary who had been classified by SYP as 'burglary other'. This category included break-ins to commercial premises, schools and domestic out buildings (sheds). Where it was possible to identify the nature of an address (domestic or non-domestic), the questionnaire was sent to the non-domestic addresses. I was assured by SYP that most of the addresses were non-domestic. I had some reservations and therefore split the questionnaires into three separate parts, which would also provide benefits at a later stage by the fact that the data could be treated as one data set or three separate data sets, and the relevant comparisons could then be made as appropriate.

Survey Methodology

All together 1,000 questionnaires were sent to victims of burglary all over the South Yorkshire area. As has already been mentioned this was split into three parts and below can be seen how many questionnaires were sent out for each part, the percentage returned and the number of useable questionnaire for each part.

The three data sets were as follows:

Part 1 - Burglaries at addresses identified as being non-domestic between July and August 1998.

Sample Size: 325

Part 2 - Burglaries at addresses identified as being non-domestic between August and November 1998.

Sample Size: 267

Part 3 - Burglaries at addresses identified as being of unknown origin between August and November 1998.

Sample Size: 408

The survey was carried out at two different times. Part 1 was carried out in September \ October, while parts 2 and 3 were carried out concurrently in November \ December.

The questionnaires were sent to victims of burglary throughout South Yorkshire, and were followed up with a reminder letter approximately two weeks later.

A number of questionnaires were returned either completely blank or with too many questions incomplete to use the questionnaire. These were counted as a response, but could not be used in the analysis.

A complete breakdown for each individual question can be found in appendix 15.

Analysis

Statistical Breakdown of Respondents

318 people (31.8%) took the time to respond to this survey.

Tables showing breakdowns by gender, age and employment status can be found in tables 2 to 4 in appendix 11.

Factor Analysis

For the purposes of analysis the data has been split into a number of different sets (see below)

- | | |
|---------------|---|
| Part 1 | - The first survey to be sent out in August 1998. (Non-domestic) |
| Part 2 | - The second survey to be sent out in November 1998. (Non-domestic) |
| Part 3 | - Sent out in November 1998. Addresses of unknown origin (some domestic and some not) |
| Part 1 & 2 | - Combination of Parts 1 & 2 |
| Part 1, 2 & 3 | - Combination of the data sets (Overall results) |

A factor analysis was carried out on each of the different data sets. Principal Component Analysis with a varimax rotation was carried out. All the analyses were pushed to include three factors.

The actual figures for the factor analysis can be found in appendix 11, tables 5 to 9.

Part 1

The factor analysis results for part 1 of the survey, reveals that with some slight exceptions the factors roughly follow the dimensions. The clearest of these is factor 2, which contains all three of the image questions and nothing else. One of the questions for image is shared with factor 1. Factor 3 contains two of the three quality questions, while there is a weak link with a claim with factor 1 for one of the expectation questions. Everything else is contained within factor 1.

Part 2

The data from this part of the survey seems to be clearer cut than that for part 1. The three image questions form factor 2, while the three quality questions form factor 3. One of the quality questions is shared between factors 1 and 2. Everything else is contained within factor 1.

Part 3

Except for the questions for image all being within factor 2, the results differ from those of parts 1 and 2. Factor 3 contains two questions from the dimension of expectations, while factor 2 also contains a question from quality. Unlike in parts 1 and 2 where the quality questions were contained within factor 3, quality seems to be predominantly within factor 1. Everything else is contained within in factor 1.

Parts 1 & 2

To some extent this analysis followed those of parts 1 and 2. The image questions were contained within factor 2, while the quality questions were contained within factor 3. There was a weak link with one of the questions from expectations with factor 1 and factor 2, and another possible link between one of the quality questions and factor 1. Everything else was contained solely within factor 1.

Parts 1, 2 & 3

In this analysis no question was split across any of the factors. As can be seen from the table above, the pattern that has been emerging from parts 1 and 2 has not been followed, which is undoubtedly down to part 3 of the survey not containing respondents answering the questions from the same perspective as in parts 1 and 2.

Factor Analysis comparisons \ summary

It would seem that the clearest split on the questions is that for each one of the five factor analyses carried out, the dimension of image is always wholly contained within factor 2. On some occasions one of the questions is shared with factor 1, but clearly there is a distinction between the questions asked for image and the rest of the dimensions.

To some extent the same can be said about factor 3 and its links with quality. However, the different parts do not always contain all of the questions relating to quality, and on some occasions questions relating to other dimensions are also present.

It would seem from the factor analyses carried out that there is further evidence that the 3rd part of the survey did not go to respondents of the same background as parts 1 and 2. That is non-domestic burglary. Therefore, while the results from part 3 and the combined data set of all three will be presented, the main emphasis in the rest of this chapter and indeed when quoting the results in other chapters will be placed on parts 1 and 2 and the combination of the two.

The Index Approach

All three models for customer satisfaction were used for analysing the data in this study. However, the ECSI model was slightly adapted from the one used in the TQM study (see *Chapter 7 - 'Private Sector Case Studies'*) due to the fact that questions about hard quality had not been included. Therefore the model was run with this dimension omitted.

The three figures with the relevant questions feeding each dimension can be seen below. The sources for each of the structural equation models are:

ACSI model:	Fornell (1982)
Sheffield Model:	Gorst et.al. (1998)
European Model:	ECSI Technical Committee (1998)

Figures 6 to 8 in appendix 11, show how the manifest variables from the questionnaire feed into the three different structured models used for analysis.

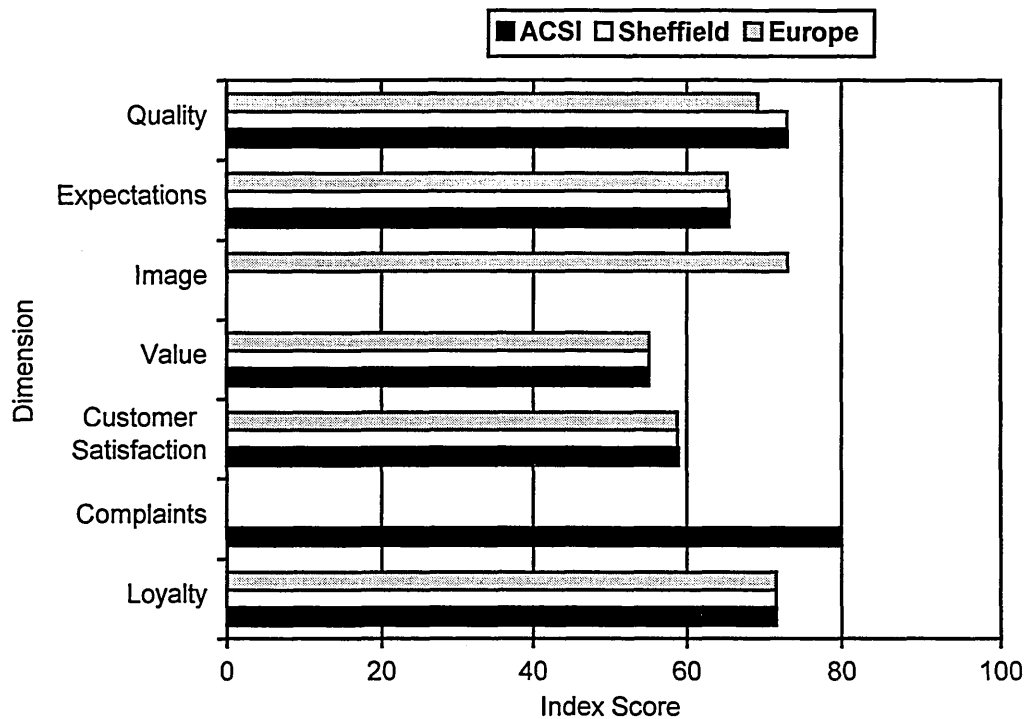
The Index Scores

As has already been mentioned, the survey was split into a number of different parts. For the purposes of the index scores the results will be reported in two ways. Firstly, parts 1 and 2 will be combined as people of the same demographic background completed them both. Part 3 will be reported separately.

Index results - Parts 1 & 2

The results for the customer satisfaction scores are very close as can be seen in figure 5.8.

Figure 5.8 - Comparison of Dimensions



The scores can be seen in a tabular format in table 9, appendix 11.

The scores generated by the three models are very close especially for the ACSI and Sheffield Models.

Path Co-efficients

The three models produced the path co-efficient values that can be seen in figures 9 to 11, appendix 11.

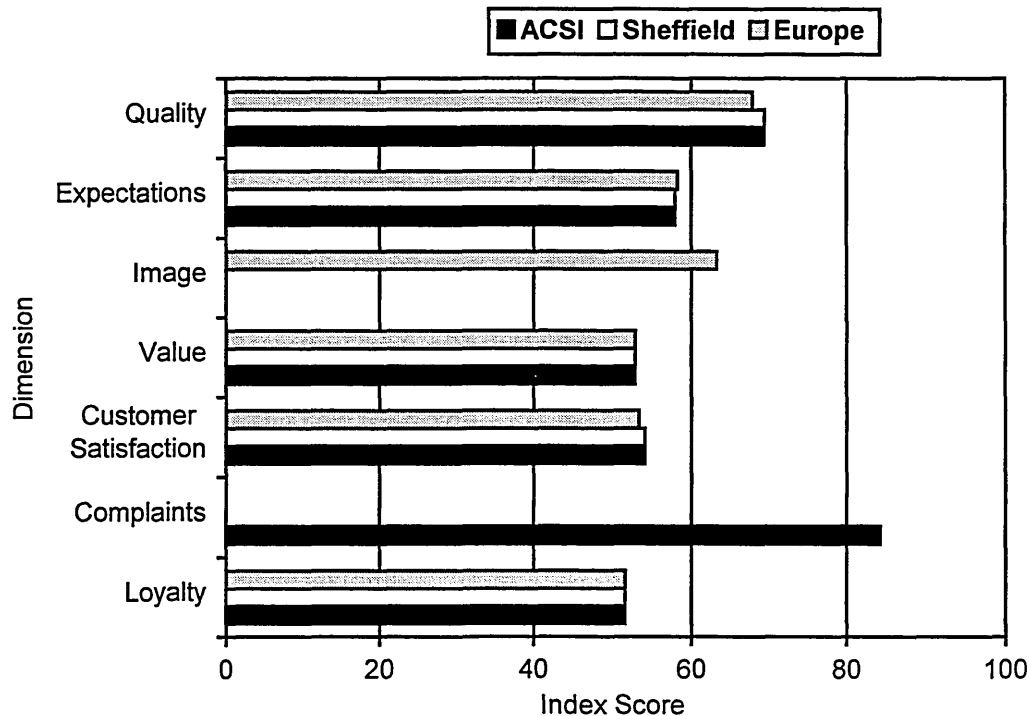
The path co-efficient diagrams for the ACSI and Sheffield models are very similar, with the only real difference being the link between customer satisfaction and loyalty. This link is stronger for the Sheffield model than the ACSI model. The R^2 values are all also of the same or similar weight.

Due to the bigger differences in structure between the ECSI model and the other two, comparisons are not as straight forward. However, the R^2 values can be compared, and the R^2 value for loyalty with the ECSI model is far higher than the value for the other two models.

Index results - Part 3

When the calculations for the Loyalty scores were made a number of errors were returned. The customer satisfaction scores from all models are still close (see figure 5.9).

Figure 5.9 - Comparison of Dimensions



As in Part 1&2, the scores are very close together, although the customer satisfaction score is not quite as close as part 1&2. For a tabular breakdown of the actual index scores see table 10, appendix 11.

Path Co-efficients

The three models produced the path co-efficient values that can be seen in figures 12 to 14, appendix 11.

As for Part 1&2 the differences between the path co-efficient values is quite small with no significant differences emerging.

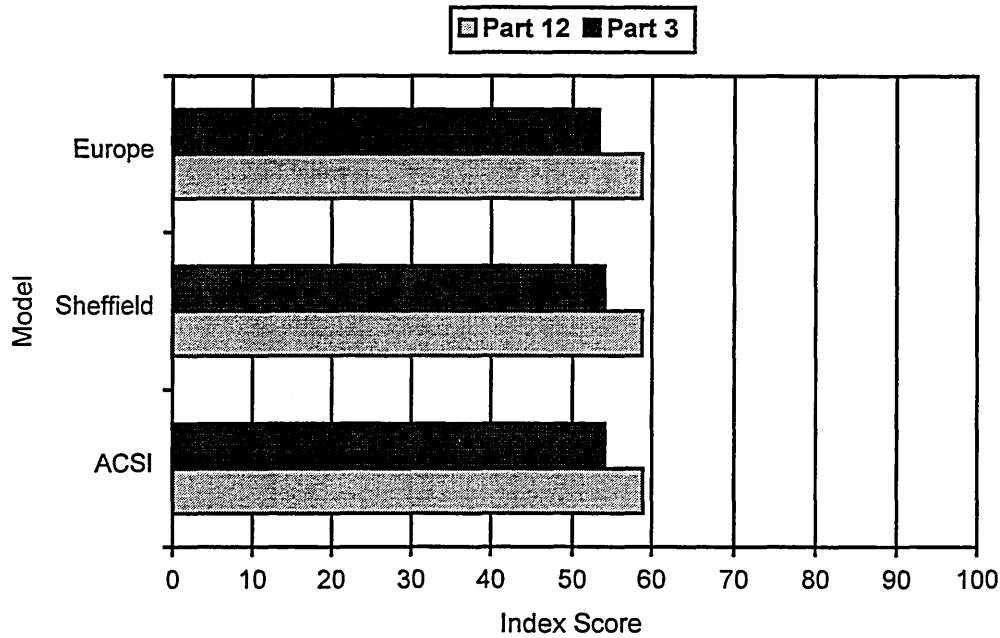
Summary of the individual parts

The fit of the data to the model in Part 1, 2 & 3, would appear to suggest that the data is not suitable for the model. This is probably due to the respondents to part 3 not answering the questionnaire with a regard to the same type of incident. This would support my initial misgivings of the addresses that were provided by South Yorkshire Police for Part 3 and the analysis provided in the Factor Analysis section.

For the rest of this chapter the data sets Part 1, Part 2 and Parts 1 & 2 will be discussed.

Comparing the index results by part and model

Figure 5.10 shows how the customer satisfaction index results compare for each of the different sets of data.

Figure 5.10 - Customer Satisfaction Index results by model and data set

As can be seen, the model in this particular case does not make any significant difference to the index score that is produced. The index score for each data set is fairly static across the three models.

Correlation

The correlations of the different questions feeding each latent variable were calculated. The results can be seen in Appendix 14.

The correlation's are bivariate, Pearson two-tailed.

As can be seen from looking at the correlation results every single correlation produces as a probability value of 0.000, showing that there is some level of correlation between the different variables. The correlation's that were carried out were:

Quality vs Expectation

Quality vs Image

Expectation vs Image

This correlation explains some of the problems that have been experienced with the ECSI model.

Other Results

A complete breakdown of the results by question can be seen in appendix 2. In appendices 3 and 4 can be found the comments which were made regarding questions 8) and 15).

One of the areas, which received the largest number of comments, was that of the police presence on the street. Many people called for more police patrols or for officers walking the beat. This is an area that many people called for in the earlier police study in 1997. However, one additional item that people were asking for was more follow up from the police regarding how the inquiry was progressing, what had happened in court or was anything else going to happen regarding the incident. Many people commented that whilst they had been promised this information they had not received any communication from the police months afterwards.

Critical Analysis

Complaints

It should be noted that the score of 82.0 awarded to complaints (1997) should be seen as good. The higher the score for complaints the better as this is really an indication of the lack of complaints rather than the number of complaints. It may prove easier to understand if the score for complaints is inverted to give a total of 18.0. It should also be noted that the questions which asked about "how the complaint was dealt with", and "the respondents satisfaction with the way in which the complaint was handled", were not included in the model calculation due to the low response rate.

It is worth noting that when creating an index for a service provider like South Yorkshire Police, it becomes very difficult to ask questions pertaining to the hard quality dimension as is required by the European model. This dimension requires questions to be asked about the physical resources of the organisation in question. In the case of a supermarket this would be things like the decor and cleanliness of the store, the layout of the store and adequacy of the car parking facilities.

However, in the case of the police most people never actually step inside a police station, maintaining contact through the telephone. Therefore, to ask questions about hard quality with regard to the police would have meant asking questions pertaining to the 'state' of the police cars or how well dressed was the police officer who attended the incident. It was felt that by asking about these would detract from the main purpose of the survey and as such questions on hard quality were omitted.

This type of problem is likely with some other types of organisation which entirely concentrate on providing their services via the telephone or, in the future through the internet. Organisations like BT. This then brings into question the applicability of the European ECSI model and its ability to be able to cope with all types of organisations.

Added to this, in this particular case study the fit of the data to the model was by far the worst for ECSI model than for the other two (ACSI and Sheffield models).

Comments

Respondents were given the opportunity to comment about areas where they felt they had cause for concern or complaint and were asked if there was anything in general that they would like to comment about. These comments are not used in any way for the calculation of the model. In future surveys where the questionnaire was concentrating on the collection of data for the index calculation these comment boxes will more than likely not be included. However, if the work is commissioned by an organisation and they request questions that are not included in the core of index calculation questions then it is possible that general comments questions would be included.

The statistics quoted in the next two sections are from the overall sample populations of 318. This includes the domestic and non-domestic responses.

Complaints Comments

The complaint comments asked the respondent to briefly outline why they thought they had cause for complaint. In general due to the nature of the question being negative, all the comments were of a negative nature.

In all 16.7% of respondents indicated that they felt they had cause for complaint, with 96.2% of these actually outlining the problem that they had experienced.

A list of these comments can be seen in appendix 8.

General Comments

In the general comment section, the views expressed were far ranging, from people who thought the police were doing a good job and offered a professional service and a caring attitude. Through to people who thought that they were doing the best that they could with limited

resources, through to people who thought they were not interested in the general public at all and had an arrogant attitude.

In all, 34.5% of respondents made a general comment about SYP.

A list of these comments can be seen in appendix 9.

5.5 Conclusion

Conclusion to 1997 study

As can be seen from the analysis, the range of comparisons and breakdowns are quite extensive allowing many different customer groups of the SYP services to be directly compared.

The different break downs that are possible allow SYP, to identify which customer groups they are serving better than others, thus allowing them the opportunity to do something about it. These different totals are all ratings for customer satisfaction, awarded by different groups of people.

Conclusion to 1998 Study

This case study has proved useful for a number of different reasons. Firstly, the large sample size has enabled testing with larger data sets to take place. Secondly, due to the number of 'burglary - others' not been as high as was necessary from a statistical point of view, it was necessary to carry out the survey at two time periods, therefore giving me two separate data sets within the one survey.

Unfortunately, due to some names and addresses not being of a 'non-domestic' nature, these questionnaires have had to be ignored for the complete survey analysis, as it was found that they were skewing the results.

Chapter 6 - Public \ Private Sector Case Study

6.1 Introduction

This chapter looks at an establishment that is a cross between a public and private sector organisation. The Yorkshire Purchasing Organisation is a public organisation in so much that is owned by a number of Local Authorities. However, the organisation operates like a private company and is expected to make a profit for its owners.

Background

The Yorkshire Purchasing Organisation (YPO) was established in 1974 as a Joint Committee of Local Authorities. The aim was, and still is, to provide a professional and cost effective purchasing and supply service to customers in member and other Local Authorities.

The YPO has an annual turnover in excess of £160 million and operates like a commercial company with no subsidies from the member authorities.

The YPO is the largest Local Authority purchasing consortium in the UK, and is governed by a management committee of elected representatives from member authorities.

Total Quality Management is the fundamental driver in YPO's commitment towards continuous improvement, and their vision statement (below) sums this up:

"It is the vision of YPO to be the prime supplier to the public sector, committed to providing consistent quality of products and service - absolute value for money.

By developing and continually satisfying the needs of customers, suppliers and the workforce, we will create confidence in a sustainable, growing business."

(Source: Yorkshire Purchasing Organisation World Wide Web Page, 1998)

Why the Yorkshire Purchasing Organisation

A study with the Yorkshire Purchasing Organisation (YPO) was carried out to ensure that the generic questionnaire that was being developed would work in other areas. The YPO, although a public sector organisation, trades under conditions similar to a private sector company. The YPO sells goods and services to other public sector organisations that are free to shop around. Therefore, the different areas of the model, expectations, quality, value, customer satisfaction, complaints and loyalty could all be measured.

Before the survey was conducted, talks between the YPO and myself took place. Through these discussions, slight changes to the questionnaire occurred so as to tailor the generic questions as closely as possible to the YPO business. Opportunity was also taken to try out a completely new expectations question. Experience from the police survey had shown that this was the most wanting area of improvement in the questionnaire.

6.2 Survey Methodology

The questionnaire was sent to schools who are customers of the Yorkshire Purchasing Organisation (YPO). The schools were all primary schools and were located in the boroughs of Doncaster, Rotherham and Stockport. The areas were chosen by YPO as these schools had not been surveyed in a recent YPO study.

150 questionnaires were mailed, 50 to each district. After a period of approximately two weeks a reminder letter was sent to those who had not responded. All together, 82 useable questionnaires were returned, a response rate of 55%. The response rate for each district can be seen below:

Doncaster	72%
Rotherham	48%
Stockport	44%

6.3 How the dimensions relate to the respondents

The dimensions

The analysis for the YPO study was carried out using two different Structural Equation Models (SEM), the ACSI model and the Sheffield model. Below can be seen what the respondents would likely to be thinking about, or looking for, from the dimensions that go to make up the two SEMs.

Expectations

The schools rated their expectations of the YPO quite highly (mean of 8.0). This is no doubt due to the fact that schools are regularly placing orders and therefore know what they are going to get in terms of service. The biggest complaint that people had about YPO was the length of time that deliveries could take to arrive. However, while they complained about the service been too slow, they were also aware that it could take up to two weeks when ordering and this therefore did not affect their expectations.

Perceived Quality

Schools will always want the best quality possible for the lowest price. Working to a limited budget however, can make this difficult. It would seem that the YPO is able to provide this, with the means for the quality questions all scoring over 8.

Perceived Value

As has already been mentioned, schools are working to a very limited budget, and therefore, the more they can get with their money the better. Increasingly, other outlets are becoming available for buying cheap stationery products and the like with the advent of the big out of town stationery stores. Therefore, the YPO is constantly looking at ways to ensure that its prices are the lowest around.

Customer Satisfaction

Like any organisation the YPO is interested in having satisfied customers, and to this end do have in place a Total Quality Management programme. However, an organisation is only as good as its customers say it is and from this limited study, the organisation doesn't seem to be doing too badly, with an index score of 78, the highest score of any case study in this research.

Complaints

Like any organisation, schools have the right to complain if they feel they are not getting adequate levels of service or quality of products. 25% of the respondents indicated that they felt they had cause for complaint. The number of people who feel aggrieved but yet do nothing about it remain a large concern for the YPO because without the complaint they cannot attempt to put things right.

Loyalty

From the schools point of view, loyalty is probably something they can only afford while the products remain the cheapest. With more and more companies starting to offer similar products on a cash and carry basis, the YPO will constantly have to look at the way in which it does business to ensure it maintains its market share.

6.4 Analysis

A complete break down of the results for each individual question can be seen in a graphical format in Appendix 19. A number of different specific analyses have been carried out and can be seen below.

Factor Analysis

A factor analysis with a varimax rotation was carried out on the results of the sliding scale questions. The result can be seen in table 1, appendix 18 (the shaded boxes indicate the most significant factor for each question with the deeper shading indicating that a factor a question is split over two factors).

The process was pushed to pull three factors from the data. Each factor referred to the following questions.

Factor 3 - Questions 6) and 7), which both ask about quality, fall into this category. The two questions look at quality from slightly different perspective. One relating to the goods while the other relates to the service.

Factor 2 - Questions 8) and 9), which both ask about price comparisons, fall into this category. Again one question refers to the price for goods and while the other asks about the level of service received. Question 10), which asks about re-purchase likelihood, is also in this factor with some overlap into factor 1).

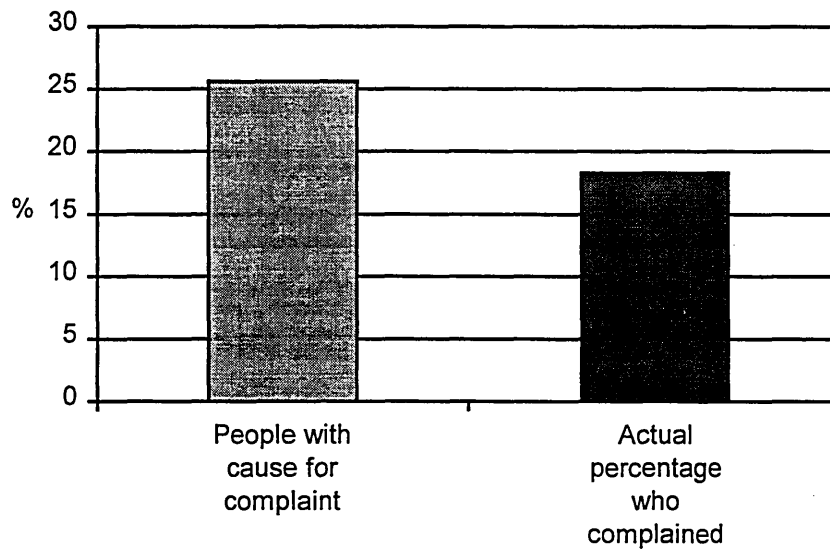
Factor 1 - This factor contains everything that does not fit into one of the other factors.

Complaints

The dimension of complaints was not used in both models, however, one of the complaints questions was used in the Sheffield Model by assigning it to the dimension of expectations.

Question 13) asked the respondent how many times they had been less than satisfied with YPO services. 25.6% of respondents indicated that they thought they had cause for complaint while 18.3% actually did. Figure 6.1 shows the number who thought they had cause for complaint, compared with the actual number who did complain.

Figure 6.1 - Number of respondents with cause for complaint vs number whom actually did



Index Model

The PLS was carried out on the data for two different SEM models, ACSI and Sheffield models. Figures 1 and 2, appendix 18 show how the different questions fed into each SEM.

The Index Scores

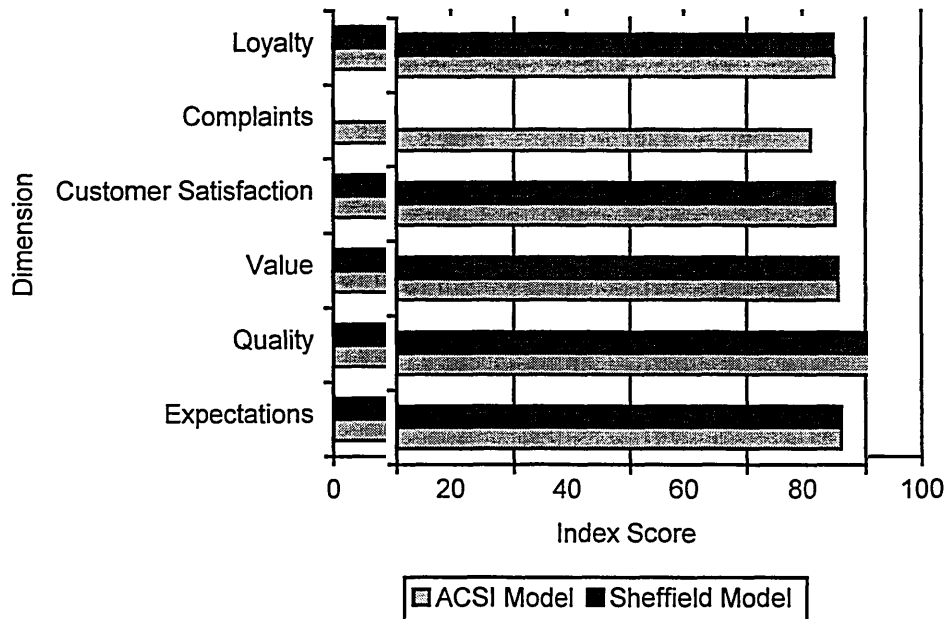
The overall customer satisfaction scores were as follows:

- ACSI Model 75.0
- Sheffield Model 74.9

As can be seen the variation on the index scores from the two different model was very small (0.1) and therefore, not significant.

The index scores for each of the latent variables were calculated and the results can be seen in figure 6.2.

Figure 6.2 - Comparisons of dimensions



As can be seen the total difference across all the different latent variables is only 0.2 index points. The actual numbers can be found in a tabular form in table 2, appendix 18.

Path Diagrams

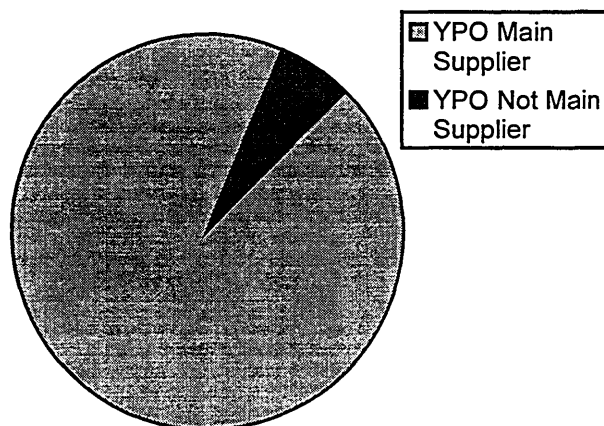
Comparisons were also made of the path diagrams, to see how the path coefficients and R^2 values compare from the ACSI model to the Sheffield model. The path diagrams can be seen in figures 3 and 4, appendix 18.

The path diagrams, like the index scores, are almost identical on a path for path comparison. In fact, the only path that is different is the path between customer satisfaction and loyalty on which there is a 0.1 difference. The R^2 values are all the same.

6.5 Other Results

Question 11) asked the respondent if YPO were the main supplier of goods to their school. 93.9% of respondents (figure 6.5) indicated that YPO were the main supplier. From the comments made on the questionnaires it would appear that the YPO will have to fight hard to keep this large percentage of a schools spend as some schools see long delivery lead times as a disadvantage when a discount office supplier may be local alternative for some products. See Appendices 20 and 21 for more details of the comments received on the questionnaires.

Figure 6.3 - Percentage of schools where YPO is the main supplier



6.6 Critique

Some of the problems indicated in the comment sections of the questionnaire could have grave consequences for the YPO and its future profits. If a sufficient number of schools look to discount office suppliers for a large amount of their stationery requirements the YPO could experience a contraction of one of their main areas of business.

Therefore, the YPO might in the future need to concentrate on an area of Total Quality Management, called Supply Chain Management (SCM). By following some of the principles of SCM, they will be able to improve their delivery times to what the customer wants rather than when they want to do it.

6.7 Conclusion

In this particular case study, the difference between the two models is very small. The index scores, and path co-efficients and R^2 values for the two models are almost the same with any differences not being significant.

On the basis of this study it would seem that the two models of ACSI and Sheffield are performing equally. It would also seem that the removal of the complaints latent variable is not having any detrimental effect on the results.

Chapter 7 - Private Sector Case Studies

7.1 Introduction

This chapter looks at the work carried out in the private sector. It looks at two case studies which both involved the World congress for Total Quality Management. The surveys were carried out at the 3rd and 4th World Congresses in the years 1998 and 1999 respectively.

Background to the World Congress for Total Quality Management

The World Congress for Total Quality Management is an annual conference held at Sheffield Hallam University. The conference brings together people from all over the world to meet and discuss the latest ideas and concepts to Total Quality Management.

The purpose of the congress is to establish a world class forum for the sharing of knowledge which will enable delegates to keep themselves at the leading edge of organisational and performance excellence. This is achieved by inviting speakers from the private and public sectors, from industry and academia, from CEO to the front line. The congress encourages input from practitioners, researchers and consultant's worldwide.

By keeping abreast of current developments and listening to feedback from previous conferences, the congress aims to provide a programme that is relevant, participative and enjoyable.

Source: Leaflet announcing the 1999 World Congress

7.2 How the dimensions relate to the respondents

The Dimensions

The analysis for the World Congress was carried out under the three different models that have been discussed earlier, the ACSI, Sheffield and ECSI models. For the purposes of this section all the dimensions for all three models will be included.

- **Human Quality**

The 1998 survey was the first study to split quality into two separate dimensions. From the point of view of the conference attendees, the human quality that they were concerned with was the level of service and quality that they received from the speakers. The speakers relevance to the delegates current activities were also included in this section.

- **Hardware Quality**

The hardware quality concerned the physical rooms of the university. The lecture theatres, syndicate rooms and cafeteria where meals were served were all of concern. The conference organisers and catering staff were also included in this category as their role was a supporting role.

- **Expectations**

The expectations of the attendees would no doubt differ depending on whether or not they had attended previously. Being an annual conference a core of the attendees were previous delegates, and therefore, to some extent they would know what to expect, whereas for the first time attendees, they would have to rely on their experience of other conferences. In fact, 46.6% of respondents indicated that this was the first time they had attended a World Congress.

- **Image**

The 1998 World Congress study was the first time this dimension had been included. The image of the conference through the eyes of the delegate is important. If the image of the conference from the delegates perspective can be matched to that of the conference organisers, then a greater understanding of the customers needs and expectations can be achieved.

- **Value**

A price tag was attached to everyone who attended the conference. However, everyone would not have directly paid for the conference, with many of the delegates employers picking up the bill, people are maybe not as circumspect about the service that they receive.

- **Customer Satisfaction**

The ultimate aim for the conference, like any other business, is to satisfy its customers to such an extent that they will return the following year.

- **Complaints**

Complaints are a useful tool for identifying where the conference is failing its delegates. Through asking people to raise their complaint on the questionnaire, the problem can be addressed and sorted for the following years.

- **Loyalty**

Following on from the customer satisfaction dimension, if delegates remain loyal to the conference and return the following year, the job of the organisers becomes that much easier from the point of view of getting people to attend again. The amount of money that is needed to advertise for new people can be quite substantial when compared to the cost of repeat attendees.

7.3 1998 World Congress

183 questionnaires were sent to all the delegates of the congress, all over the world. By the cut of date, 88 had been returned, and were subsequently used for analysis. A small number were returned after the cut off date and were used for comments only. The response rate was 48.1%.

The questionnaires were sent out approximately one week after the close of the conference.

The questionnaire used to collect the data was a complete re-design on the previous ones. A copy of the questionnaire can be found in appendix 5. Details of the questionnaire development can be found in '*Chapter 3 - Methodology, A Customer Satisfaction Index*'.

Analysis

Nearly half of the total population returned the questionnaire before the cut off date. Therefore, although the sample size was below what might be ordinarily required to give results, which are within ± 2 index points, due to the fact that everyone had been given the chance to respond the results should prove reliable if compared in the future.

As in the other case studies a number of different analyses' were carried out, and can be seen below.

Statistical Breakdown

The responses to the survey were broken down in the following way.

- **Gender of respondents**

73.9% of respondents were male

26.1% of respondents were female

- **Age of respondents**

A summary of the ages of delegates who responded can be found in table 1, appendix 22.

- **Employment status of respondents**

A summary of the employment status of the delegates who responded can be found in table 2, appendix 22. Almost two thirds of the respondents were from business \ industry.

Factor Analysis

A factor analysis was also carried out on the data. Using Principal Component Analysis, a varimax rotation was carried. The data was pushed to include '5' factors. The full results of the factor analysis can be found in table 3, appendix 22.

Factors 3 and 4 both contain questions relating to expectations. One of the image questions is the only question contained within factor 5. The majority of the quality questions are contained within factor 2. Everything else comes in factor 1.

The Index Approach

Due to the number of different models available at the time of this survey, it was decided to use them all for analysis purposes so that comparisons could be made for each of the different approaches. In this case study only the top level analyses have been included, more in-depth PLS analysis can be found in '*Chapter 4 - Model Development \ Validation \ Data Analysis*'.

The data from the 3rd World Congress for Total Quality Management was the first data set to include questions for the dimension of image. When running the model for the ACSI and Sheffield models these questions were ignored.

Figures 1 to 3, appendix 22 show the models and how the different questions feed in to the different dimensions (latent variables) of each model.

The Index Scores

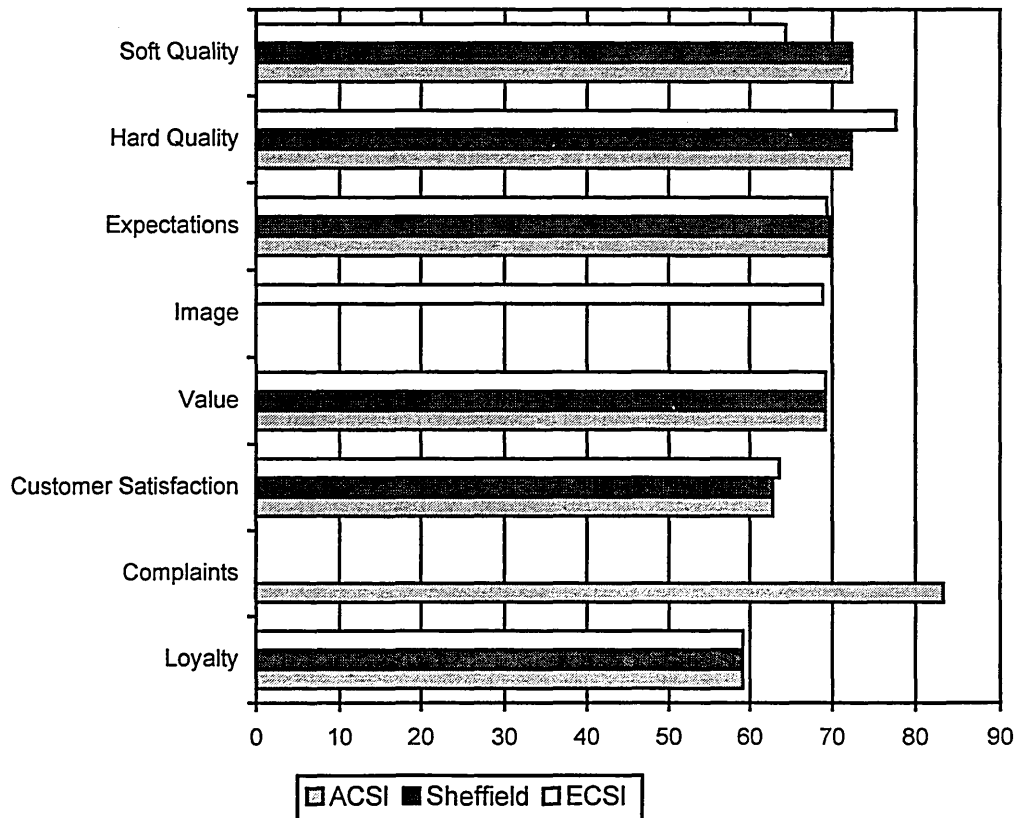
The overall customer satisfaction index scores were as follows:

- ACSI model 62.81
- Sheffield model 62.79
- ECSI model 63.52

As can be seen from the results above, there is only a small amount of variation on the customer satisfaction score regardless of which model was used. The total variation of the index scores across the three models is 0.79 index points.

The first pass for each model, including all the useable index questions, produced the following results by dimension as can be seen in figure 7.1.

Figure 7.1 - Graphical comparison of dimensions



As can be seen from the graph above, the calculations for the dimension totals do not vary by very much. The variations between the ACSI and Sheffield models are very close. The biggest variations are between the ECSI model and the other two on the dimension of quality. It can be seen that the ECSI model gives more detail about where the weight of the quality score is coming from. It can be seen that the respondents rate the conference facilities more highly than they do the speakers.

Due to only one question feeding into the dimension of value, the score is identical for each run of the model. This is because when there is only one manifest variable feeding the latent variable, the weight assigned to the manifest variable by PLS is always '1'. Therefore, due to the mean for the question being fixed, it is always the same numbers which are entered into the index calculation formula, regardless of which model is being run. For this reason, it is important that where possible, at least one question should be used to measure each dimension.

Difference between old and new customers

Question 7) asked respondents to indicate their overall experience for their most recent congress. Slightly over 50% of the respondents indicated that the 1998 congress was their first attendance. Therefore, an analysis of first time and previous attendees has been carried out. The comparisons have been made using the Sheffield model.

Table 7.1 indicates the difference in index results for the first time delegates and for the delegates who had attended previously.

Table 7.1 - Previous delegates compared with first time delegates

	Previous Attendee	First Time Attendee	Difference
Expectations	74.18	65.35	8.83
Quality	78.67	75.48	3.19
Value	72.11	67.44	4.67
Customer Satisfaction	64.58	62.13	2.43
Loyalty	66.33	55.78	10.55

As can be seen, the previous attendees score the conference on every dimension.

Difference between academic and business delegates

In the personal section at the end of the questionnaire, the respondents were asked to indicate which occupation they would class themselves as being. After splitting the data, the index totals were calculated for the business people and the academic people. Table 7.2 shows the comparison between the two occupations.

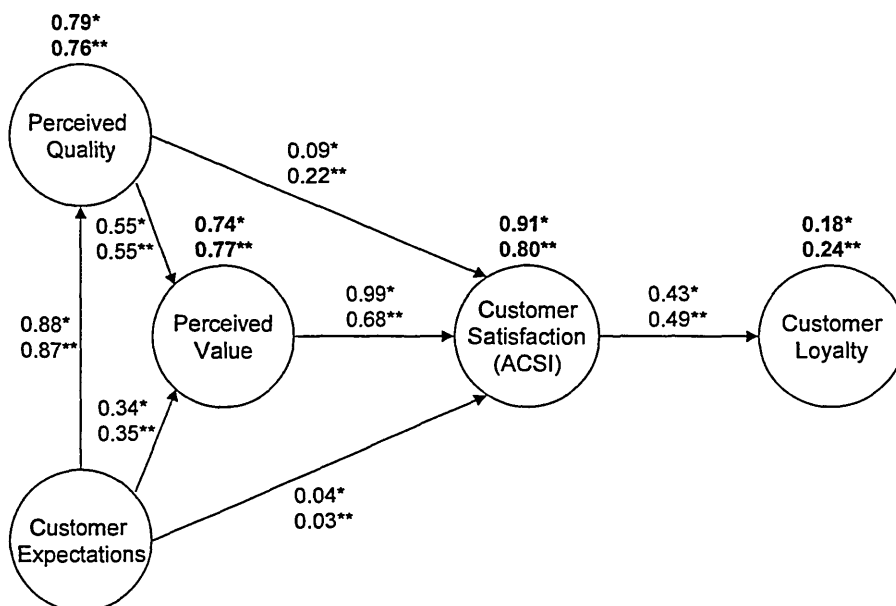
Table 7.2 - Business people compared with academic people

	Business People	Academic People	Difference
Expectations	69.82	69.53	0.29
Quality	78.42	66.55	11.87
Value	68.55	70.89	2.34
Customer Satisfaction	61.66	65.78	4.12
Loyalty	54.12	50.22	3.9

The expectations' scores are about the same. However, the business people rate the quality more highly than the academics, but rate value for money lower. This fall has an effect on customer satisfaction, which is lower for business people than academics.

The rise and fall of some results can be explained more clearly with the use of the path co-efficient diagram as seen in figure 7.2.

Figure 7.2 - Path co-efficient diagram, Business \ Academic Delegates



As can be seen the path from value → customer satisfaction for the academic model is very strong, which explains why the customer satisfaction index score for the academics is as strong as it is in comparison to the business people.

Other Results

A number of other statistical techniques and analyses' were carried out on the data. These can be seen in the appendices at the end of the thesis.

- Appendix 23 - Correlation of latent variables against other latent variable
- Appendix 24 - Distributions for each individual question
- Appendix 25 - Comments regarding causes for complaint
- Appendix 26 - General comments

7.4 1999 World Congress

As a follow on to the 1998 World Congress study, the survey was repeated in 1999. The questionnaire used was similar to the one used in 1998 although one or two changes and additions were included. A full explanation of these can be seen in *'Chapter 3 – Methodology, A Customer Satisfaction Index'*. A copy of the questionnaire can be seen in Appendix 7.

The survey methodology was also slightly amended. For this particular study the questionnaires were handed out with the delegate packs. Delegates were asked to leave the completed questionnaire either at the end of the conference or to return it by post as soon as possible following the completion of the conference.

Statistical Breakdown

In total 62 questionnaires were returned before the cut off date. The responses to the survey were broken down as follows.

- **Gender of respondents**

74.2% of the respondents were male

24.2% of the respondents were female

1.6% of respondents did not complete this part of the questionnaire

These results are very similar to the results collected in the 1998 study.

- **Age of respondents**

A summary of the ages of the 1999 respondents can be found in table 5, appendix 22.

- **Employment status of respondents**

A summary of the employment status of the respondents can be found in table 6, appendix 22.

In comparison to 1998, there were more academic attendees and less business people. The number of attendees from the public sector also increased.

Factor Analysis

A factor analysis was carried out on the data. Using Principal Component Analysis, a varimax rotation was carried out. The data was pushed to include '6' factors. Table 7, appendix 22 shows the results. The shaded boxes indicate the most significant value for each question.

- **Factor Analysis – Expectations**

The questions in this latent variable are spread over three different factors. Factors 4, 5 and 6. One of the questions is split over all three of these factors while the remaining four questions are located exclusively in one factor only.

- **Factor Analysis – Quality**

The questions that make up the latent variable of quality are found in two different factors, factors 1 and 2 with a slight overlap to factor 6. If the latent variable of quality is split into the area of hard quality and soft as required by the ECSI model, the latent variable of hard quality is enclosed within factor 2, with only a slight overlap of one question to other factors. The latent variable of soft quality, has two questions in factor 1, with the third factor split over factors 2, 3 and 4.

- **Factor Analysis – Image**

The majority of the image, latent variable questions are either located in factor 1 or have some influence in factor 1. There is also an influence on factor 2, with a very slight influence on factor 3.

- **Factor Analysis – Value**

Two of the questions are in factor 1 while the third question is in factor 2.

- **Factor Analysis – Customer Satisfaction**

The question that made up this latent variable are all covered in factor 1 and to some extent factor 3.

- **Factor Analysis – Loyalty**

All three questions that make up the latent variable of loyalty are split over two different factors: Factors 1 and 3.

The Index Approach

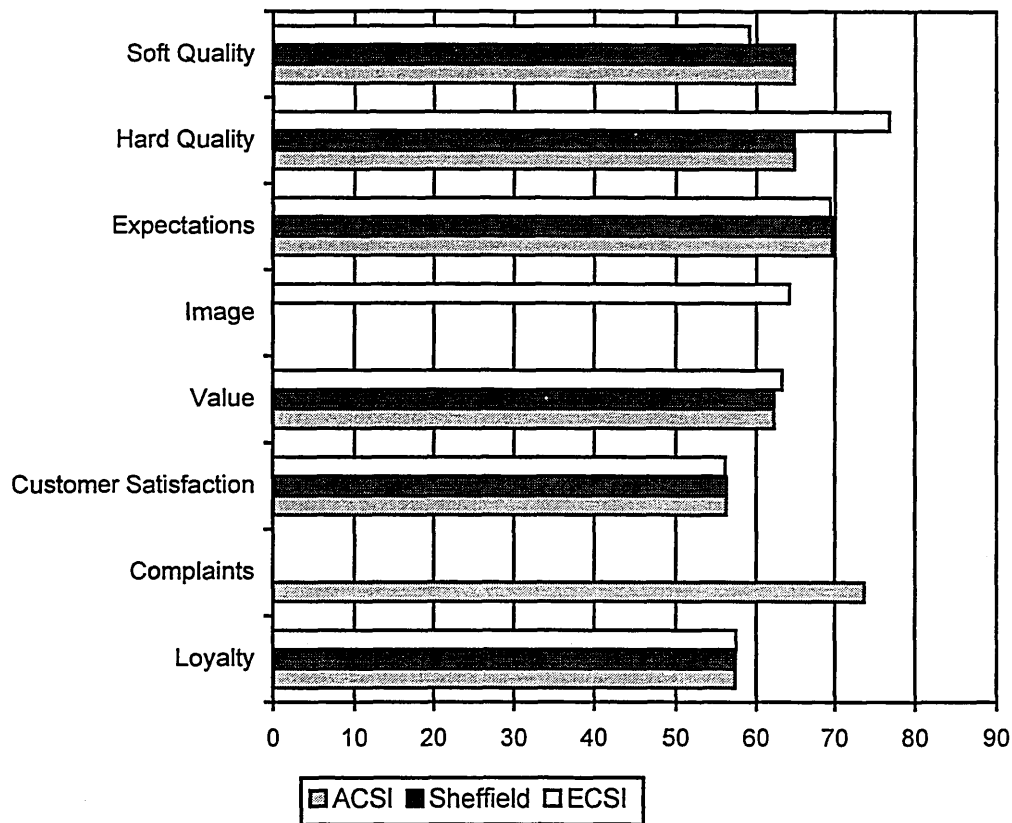
The data was run using the three different models that have been developed. Figures 4 to 6 show how each of the questions feed into the dimensions of the model. Note, the dimension of value has for the first time in any of the case studies, three manifest variables feeding into it.

The Index Scores

The overall customer satisfaction index scores using the different models were as follows:

- ACSI model 56.25
- Sheffield model 56.25
- ECSI model 56.13

The variation on the three scores is once again very close. If the scores for the other dimensions are graphed, it can be seen (figure 7.3) that these scores are also close.

Figure 7.3 - Comparisons of dimensions

As in 1998, the index score for hard quality is still significantly higher than the index score for soft quality, indicating that people still see the quality of the speakers as being an issue that needs addressing.

Another point that is worth pointing out, is that in previous studies the index scores for the dimension of value and loyalty have often been exactly the same across the three models because only one manifest variable has fed that particular dimension. In this study three manifest variables have fed the two dimensions, and while the scores are not exactly the same across the three models, they are very close.

Differences between business people and academics

As in the 1998 study comparisons have been made between the index scores for the business and academic delegates. The results are shown in table 7.10.

Table 7.10 - Differences between business and academic delegates

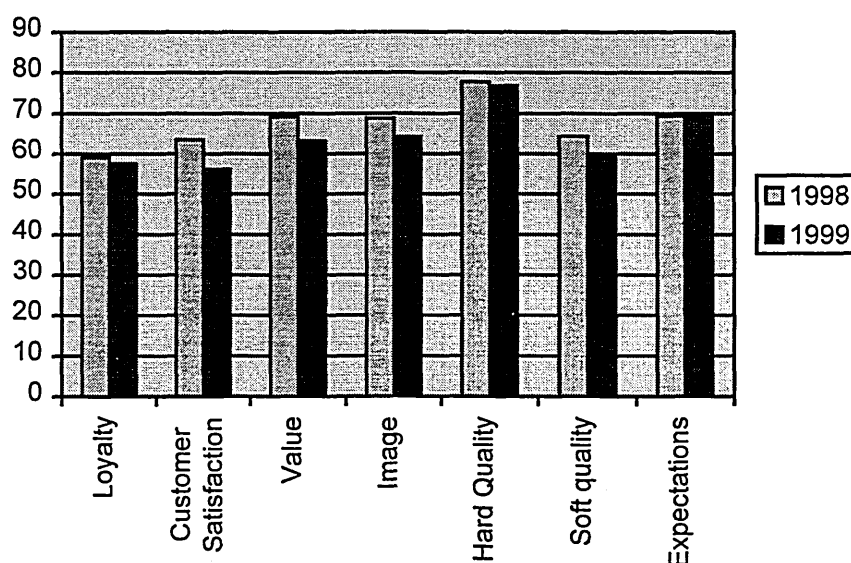
	Business People	Academic People	Difference
Expectations	70.44	68.81	1.63
Quality	68.48	67.67	0.81
Value	64.21	59.31	4.9
Customer Satisfaction	56.64	51.53	3.11
Loyalty	54.32	55.64	1.32

In comparing the results with 1998, the most notable feature is that the two sets of peoples results for 1999 are far closer than they were in 1998. In fact the total difference in 1999 is 11.77, which is less than the difference for quality alone in 1998. The 1998 total difference is 22.52, almost double.

Overall the figures are lower, but on this occasion the business people score a higher customer satisfaction index than their academic colleagues. This is due to the larger pat co-efficient feeding in from quality for the business people than the academics.

Comparisons between 1998 and 1999

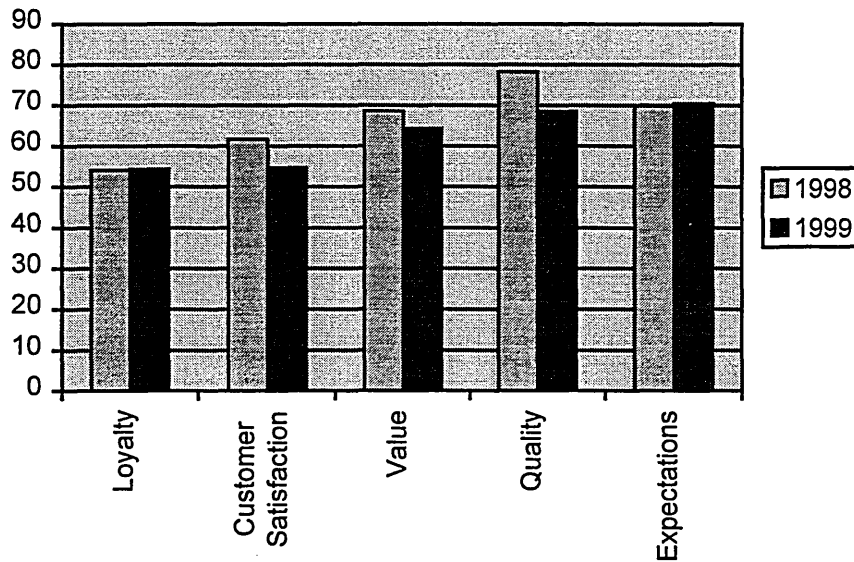
Figure 7.4 shows how the individual dimensions compare from 1998 to 1999. The comparisons have been made using the ECSI model.

Figure 7.4 - Overall Data - Comparison between 1998 and 1999

The distribution of the two graphs above take on a very similar shape, but the 1999 index scores are all slightly lower than the results for 1998.

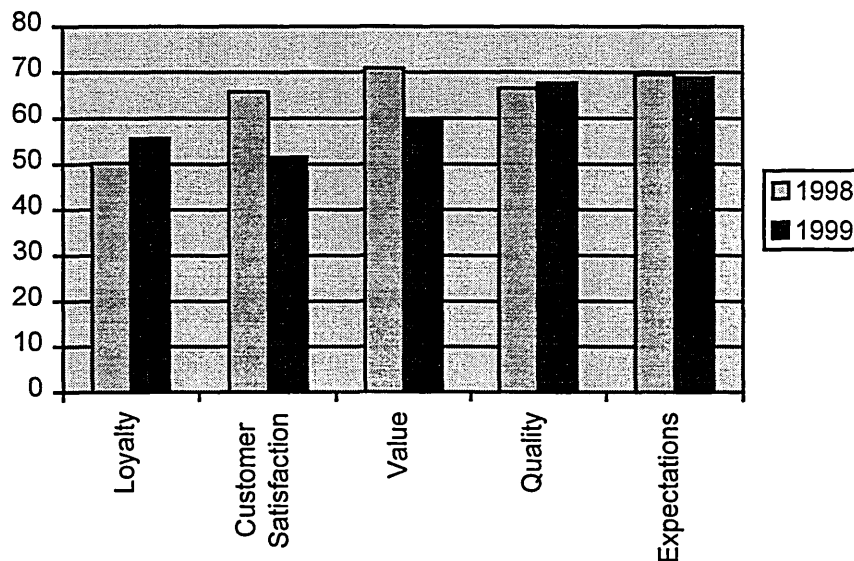
Figures 7.5 and 7.6 compare the individual dimension scores for the business people and academics. Comparisons have been made using the Sheffield Model.

Figure 7.5 - Business People - Comparison between 1998 and 1999



As for the overall index totals the distributions are fairly similar, although in this case the difference between the two is larger.

Figure 7.6 - Academic People - Comparison between 1998 and 1999



In the case of the academic people, the difference between the shapes of the graphs is larger, likewise the difference between individual index scores. The 1999 result for customer satisfaction is significantly lower, although loyalty has increased.

Other Results

A number of other statistical techniques and analyses' were carried out on the data. These can be seen in the appendices at the end of the thesis.

- Appendix 23 - Distributions for each individual question
- Appendix 24 - Comments regarding causes for complaint
- Appendix 25 - General comments

7.5 Conclusions

World Congress, 1998

As has been seen in earlier chapters, TQM includes customer satisfaction as one of its driving principles. Therefore, it is likely that people who attended the congress are more likely to complete the questionnaire harshly than someone who's background was not in this area. In addition, the people who attended the conference are more likely, as a group, to be more focused on what they expect and feel that they should receive in terms of service than possibly the respondents from some of the other surveys that have been carried out in the process of this research.

Some questions could not be included because of the number of non-responses or problems connected with a particular question. For example, one of the questions asked about the social evening, the conference dinner and the coach service. However, due to the fact that not all delegates used these services, an option was given for the respondents to be able to indicate their non-use. Due to the large number of respondents who did not use these services, this question was completely ignored for the index purposes.

In the conference pack a very basic questionnaire was included for the delegates to complete. The questionnaire looked at their satisfaction with individual sessions and speakers. Therefore, due to this questionnaire already having been asked, this might have had an inverse effect on the response rate for this survey.

Structural Equations Modelling vs Factor Analysis

As has been discussed in '*Chapter 3 - Methodology, A Customer Satisfaction Index*', Structural Equation Modelling (SEM) and Factor Analysis have some commonality. However, from the World Congress data there can be seen some differences and similarities in the results produced. When comparing against the ECSI model, which has seven dimensions, the first difference is that factor analysis only produces five factors, and this is only after the techniques has been pushed from four.

However, when the questions in each of the factors are identified there are a number of similarities. Ignoring factor 1, which seems to be the factor where everything that cannot be classified as belonging to something else is put, the following occurs:

- Factor 2 contains Q5a), Q5b), Q5c), Q5d) and Q5e), all of which have been assigned to one of the quality dimensions in SEM.
- Factor 3 contains Q2a), Q2b and Q2c), all of which have been assigned to the expectations dimension in the SEM.
- Factor 4 contains Q2d)and Q2e), which have also been assigned to the expectations dimension in the SEM.
- Factor 5, which the factor analysis was pushed to create, contains just one question, Q14c), which is part of the image dimension. The other three questions, which feed image, are all found in factor 1.

As can be seen from the above results, while the factor analysis may not separate the questions to factors in exactly the same way as the SEM has been defined, there are a number of similarities.

Factor analysis can only deal with sliding scale questions, whereas the SEM can also work with yes \ no type questions.

World Congress, 1999

The 1999 study was the first study to include more than one useable manifest variable for each latent variable. This undoubtedly adds to the overall benefit of the results as more analysis is possible, and greater feedback to the client is possible.

For example, in the value for money dimension, in previous studies an explanation to a client might consist of 'People think the price is too high'. Whereas in this particular study there were three questions feeding the dimension, and it is possible to see which of the three questions was having the greatest influence on the index score. The value for money questions asked the respondent to rate the price of the congress in relation to three different areas. These were,

- Service received
- Assortment of speakers
- Quality of speakers

The PLS calculated different weights for each of these questions in relation as to how important each one was in the overall scheme of the model. The weights for the three questions can be seen in table 7.11.

Table 7.11 - Weights for the dimension of Value

Question	Weight
Service received	0.3077
Assortment of speakers	0.5524
Quality of speakers	0.2917

This information shows the client which areas to concentrate on if he wants to increase his score for value. In fact, if the mean values for each question was increased by '1' in turn (everything else being equal), the index score for value would increase. This is shown in table 7.12.

Table 7.12 - Increase each mean by '1'

Question	New Index Score for Value if mean increased by '1'	Increase of:
Service received	65.23	2.97
Assortment of speakers	67.59	5.33
Quality of speakers	65.05	2.79

The current index score for value is 62.26

This increase would also have a knock on effect to the customer satisfaction and loyalty index scores. This technique is covered in more detail in, '*Chapter 8 – Customer Satisfaction Seekers Approach*'.

In conclusion, the two World Congress data sets have shown that the index methodology can be carried in the private sector successfully.

Chapter 8 -
Customer Satisfaction Seekers Approach

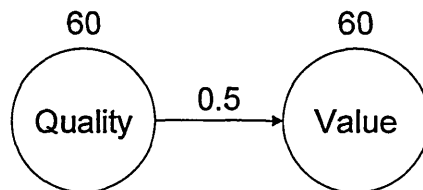
8.1 The effect of a rise in one latent variable and its influence on another

Upon completion of the customer satisfaction index, the organisation will have a number with which it can compare itself against other companies and industries. However, what if the company wants to improve its own customer satisfaction score. How does it go about it? What areas should it concentrate on in order to bring about the biggest improvement in its customer satisfaction index score?

To answer these questions the customer satisfaction seekers approach has been developed. By looking at the results generated by the PLS methodology and the general statistics that have been generated by the data set a number of different conclusions can be made.

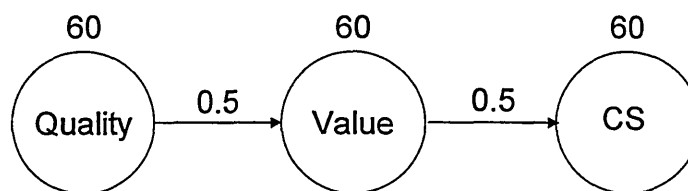
As has been discussed earlier, the path co-efficient value is the proportion of change that one latent variable will have on another if the first latent variable was to increase by 1 index point.

Figure 8.1 - Effect of a path co-efficient



For example in figure 8.1, if the value of quality was to rise by 5 index points, then the effect on value would be to bring about a rise in its index score of 2.5, bringing its overall score to 62.5. This is true through out the model and some increases would also have knock on effects to other latent variables as can be seen in figure 8.2.

Figure 8.2 - Further effect of a path co-efficient



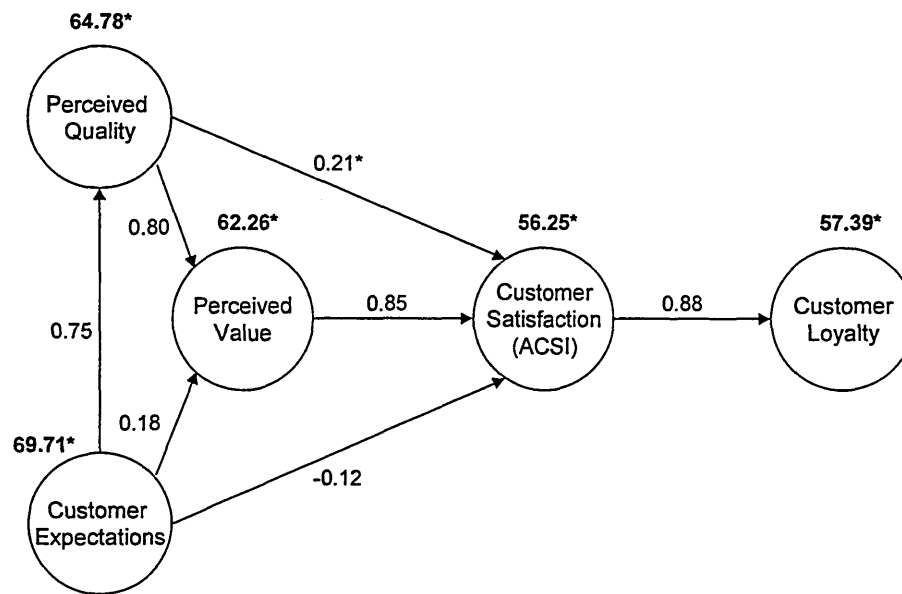
The initial increase in quality by 5 index points would increase the index score of value to 62.5, which would in turn increase the value of customer satisfaction by a further 1.25 to 61.25 index points.

This technique can therefore be used to see what the effect would be on a customer satisfaction index score if other latent variable scores were increased.

8.2 World Congress for Total Quality Management, 1999

Taking the 1999 World Congress data, the path co-efficient model was in figure 8.3 was produced.

Figure 8.3 - World Congress (1999) path co-efficient diagram



* Original Index Score

It assumed that the value for expectations is fixed as this is an exogenous latent variable and influencing it is not completely within the control of the organisation. Therefore, to increase the value of customer satisfaction, it is only possible to look at the latent variables of quality and value. It is also possible to look at the manifest variables, which feed directly into customer satisfaction.

The knock on effect of increasing a latent variable by 5 index points

By taking the value for quality (64.78) and increasing it by 5 index points (everything else remains the same) it is possible to work this through the model and see that it will have an influence on the customer satisfaction score of 4.45. This is calculated by summing the two different paths through the model.

The two paths can be seen in figures 8.4 and 8.5.

Figure 8.4 - Effect on particular paths

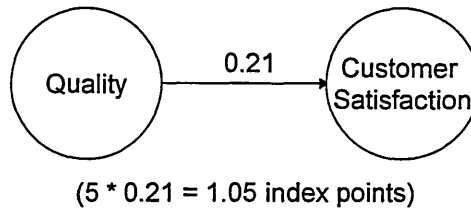
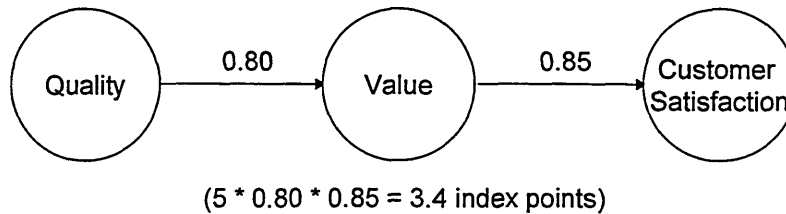


Figure 8.5 - Effect on particular paths



The sum of 1.05 and 3.4 is 4.45. The 4.45 is then added to the original customer satisfaction score giving a new total of 60.7.

Likewise it is possible to fix all the latent variables except for value, which can be increased by 5 points. This would have the effect of adding 4.25 to the customer satisfaction score.

As can be seen it is slightly more beneficial to work on increasing quality as this will have a larger knock effect to customer satisfaction.

A further option would be to carry out both of these increases at the same time. This would have the effect as can be seen in figures 8.6 to 8.8.

Figure 8.6 - Effect on a particular paths (part 1)

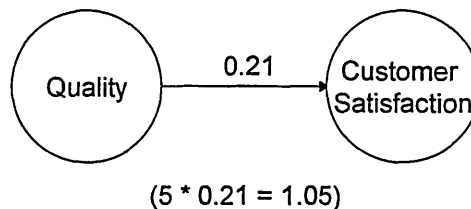
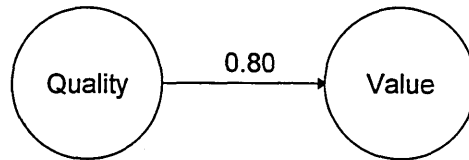
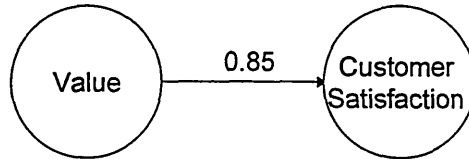


Figure 8.7 - Effect on a particular path (part 2a)

$(5 * 0.80 = 3.4)$. The 3.4 is then fed into figure 8.8)

Figure 8.8 - Effect on a particular path (part 2b)

$[(3.4 + 5) * 0.85 = 7.14]$

Therefore, the customer satisfaction score is the sum of figure 8.6 and 8.8. This would be an increase of $7.14 + 1.05 = 8.19$ index points to 64.44.

Higher path co-efficient values would make increasing a preceding latent variable more appealing than one with a lower path value as the greater the path co-efficient value, the greater the increase in the latent variable index score.

Alternatively, it may be necessary to calculate by how much it is necessary to increase one of the latent variables in order to increase the index score of customer satisfaction.

8.3 Reverse Calculations

If a customer satisfaction score is required which is 5 points higher and the organisation wishes to concentrate on quality they would have to increase quality by:

The two paths have a sum of: $0.21 \text{ plus } (0.80 * 0.85) = 0.89$

If the two paths are calculated as being a proportional of the total 0.89 then it can be seen that path 1 has 24% while path 2 has 76%.

By using the proportions it is then possible to work backwards.

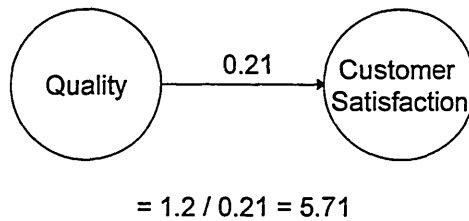
24% of 5 = 1.2

76% of 5 = 3.8

Path 1

Path 1 can be seen in figure 8.9.

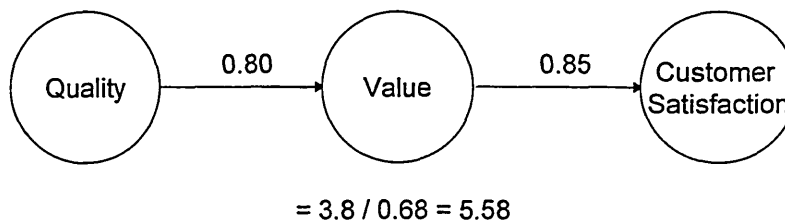
Figure 8.9 - Path 1



Path 2

Path 2 can be seen in figure 8.10.

Figure 8.10 - Path 2



Therefore, the amount to increase Quality by:

$$(5.71 + 5.58) / 2 = 5.65$$

If quality is increased by 5.65 the value for customer satisfaction will increase by 5.018 (the 0.018 is accounted for by rounding error).

8.4 Individual Latent Variables

Once it has been established which latent variable is having the most influence on customer satisfaction it is then possible to look more closely at the particular latent variable in question and see which manifest variables are having the biggest influence. It is then possible to identify which areas to improve in order to see the greatest returns.

Table 8.1 shows the weights for each manifest variable that feed the latent variable of quality within the World Congress (1999) data.

Table 8.1 - Weights for the Quality Latent Variable

Question	Weight	Mean
Quality of Speakers	0.5545	6.441
Relevance of Speakers	0.2935	6.237
Overall Staff Courtesy	0.2159	8.305
Locations of Syndicate Rooms	0.0374	7.593
Conference Venue Facilities	0.0412	7.864

The weights in table 8.1 are used in conjunction with the means to calculate the index score for the latent variable using Fornell's (1996) formula as can be seen in figure 8.11.

Figure 8.11 - Fornell's formula for calculating the index scores

$$ACSI = \frac{\sum_{i=1}^3 w_i \bar{x}_i - \sum_{i=1}^3 w_i}{9 \sum_{i=1}^3 w_i} \times 100$$

Fornell et. al. (1996)

As can be seen the biggest weight occurs for the quality of speakers manifest variable. However, the mean for this particular question is the fourth in terms of size. Therefore, an increase in the mean for quality of speakers would have an effect on the overall quality score.

In fact, a 1 point increase in the value of the mean to 7.441 would lead to the latent variable of quality increasing its value from 64.78 to 70.17.

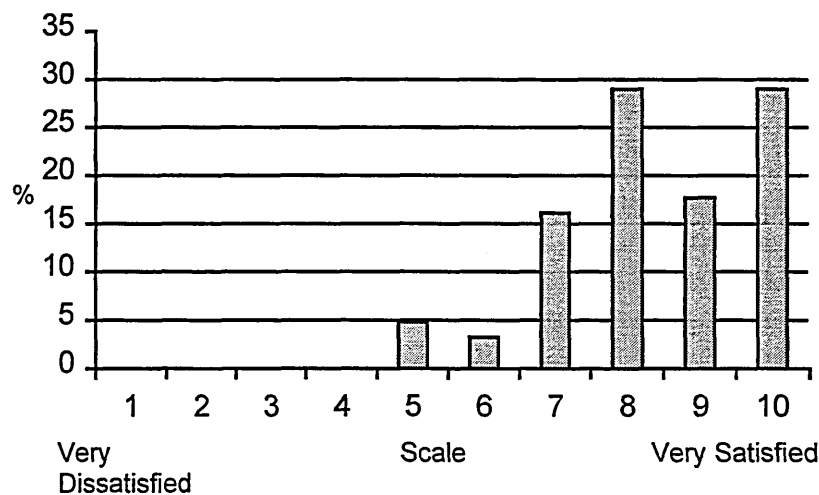
In contrast, a 1 point fall in the mean of each, of the last two manifest variables would have very little effect on the quality latent variable score (64.78 to 64.01).

In some cases it might be desirable to look in even more detail at the manifest variables.

Individual Distributions

Some manifest variables might be producing distributions, which were not expected, and therefore by looking closely at individual distributions it might be possible to improve means by improving the look of a distribution. For example, by ensuring that long negative tails do not occur, it is possible to see an improvement in the mean (see figure 8.12).

Figure 8.12 Overall Staff Courtesy



Mean 8.305

As can be seen in figure 8.12, the mean is already fairly high. However, between twenty and twenty-five percent of the delegates have rated staff courtesy as seven or below. By increasing these peoples scores to eight, nine, or ten, and thus increasing the mean to nine, would have the effect of increasing the quality score from 64.78 to 66.24 an increase of 1.5 index points. This would in turn have a knock on effect to customer satisfaction increasing its score by 1.335 to 57.59.

All though this might not seem a very large jump, this is only looking at one particular manifest variable for the quality latent variable, and in an area that would not require that much effort.

While improvements in other manifest variables would bring about even greater improvements, the actual effort to bring about these improvements might be great. However, in the long term these extra efforts would be worthwhile.

Table 8.2 shows how much the customer satisfaction index score would improve by a one point increase in the mean of each manifest variable from the latent variables of quality and value. Note that these improvements are for only one manifest variable at a time, with everything else remaining equal. The original customer satisfaction index score was 56.25.

Table 8.2 - Improvements in the mean of manifest variables (World Congress, 1999)

Manifest Variable	Customer Satisfaction Score after increasing the manifest variable mean by '1'	Increase in the index score of:
Quality:		
Quality of Speakers	61.05	4.80
Relevance of Speakers	58.79	2.54
Overall Staff Courtesy	58.12	1.87
Locations of Syndicate Rooms	56.57	0.32
Conference Venue Facilities	56.60	0.35
Value:		
Service Received	58.77	2.52
Assortment of Speakers	60.78	4.53
Quality of Speakers	58.64	2.39

As can be seen the biggest improvement when looking at the two latent variables of quality and value come about by increasing the mean of the 'Quality of Speakers'. This is also backed up by the comments received on the questionnaire, which in some cases' comment about the failures of some of the speakers (see appendices 24 and 25 for a complete list of comments).

The least benefits are obtained by increasing the means for the location of the syndicate rooms and the overall conference facilities. This shows that there were no real issues with these two areas in terms of quality.

The latent variable of value has the biggest improvement on customer satisfaction index score if the manifest variable of Assortment of Speakers was improved.

This sort of information is useful to the surveyed organisation as it allows them to look at their strategy for the future. In this particular case, the World Congress, the organisers can take this

information to see where the problems and opportunities lie. As has been shown the venue is not causing any adverse problems and spending time and effort to improve them would not lead to any significant improvements in the customer satisfaction index score. The largest benefits can be achieved in concentrating on the assortment and quality of the speakers used.

The process can also be followed through to see the effect that this would have on the Loyalty score. If an increase in the mean of 'Quality of Speakers' in the quality latent variable was carried out this would have a knock on effect to the loyalty index score of 4.22.

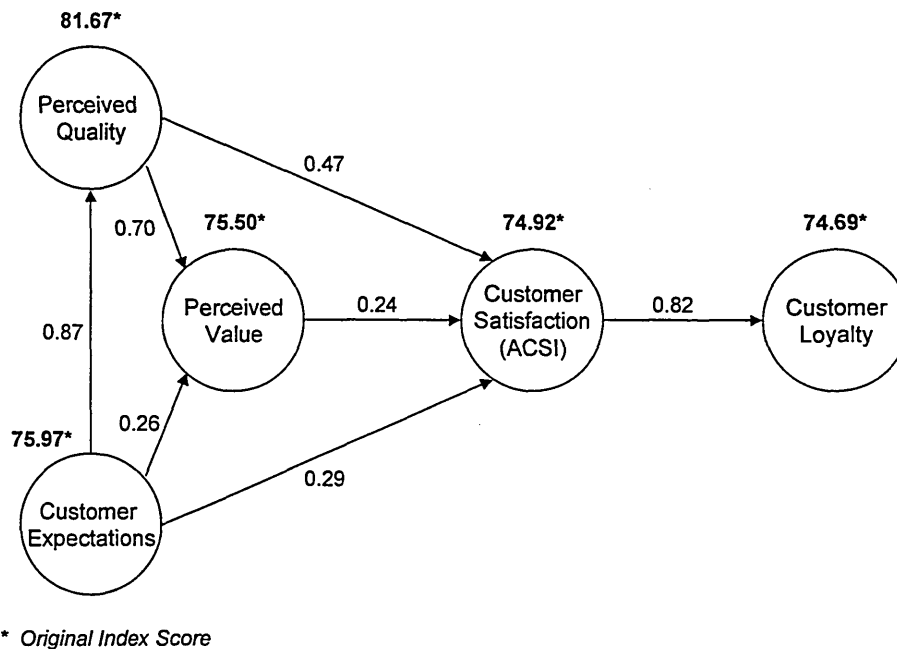
It should also be noted that in a real world situation, organisations would look at improving more than one area at a time, which would bring about even greater returns in terms of the overall index score.

A similar type approach can be taken for any data set.

The Yorkshire Purchasing Organisation

The Yorkshire Purchasing Organisation (YPO) data produces the path co-efficient diagram as can be seen in figure 8.13.

Figure 8.13 - Yorkshire Purchasing Organisation path co-efficient diagram



If the aim is to increase the customer satisfaction score by 5 index points then following the same process as above, it is therefore necessary to increase the latent variable of quality by 7.86 index points

Individual Distributions

Table 8.3 shows how much the customer satisfaction score would improve by a one-point increase in the mean of a particular manifest variable. The original customer satisfaction index score was 74.92.

Table 8.3 - Improvements in the mean of a manifest variable (YPO)

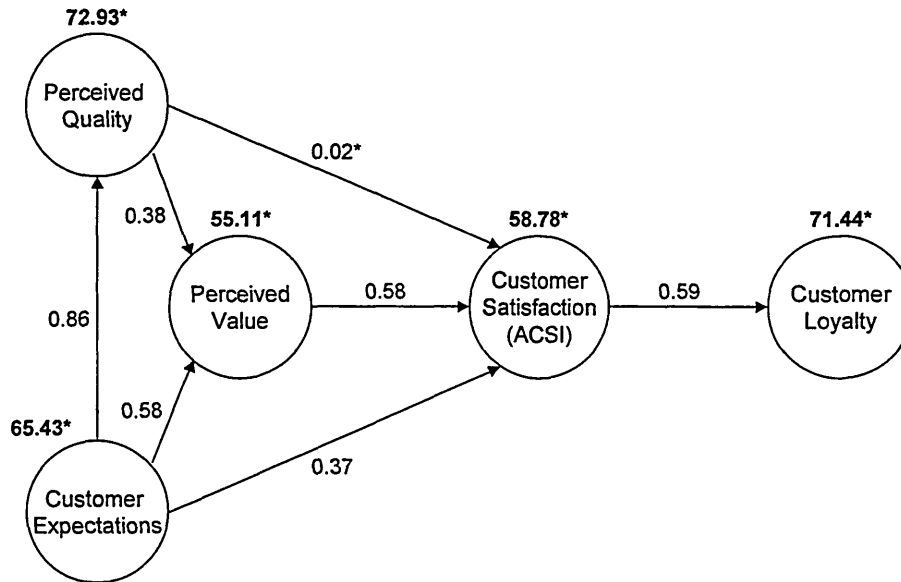
Manifest Variable	Customer Satisfaction Score after increasing the manifest variable mean by '1'	Increase in index score of:
Quality:		
Capability of staff	76.86	1.94
Quality of service	76.28	1.36
Quality of goods	75.98	1.06
Importance of quality in relation to service	76.09	1.17
Importance of quality in relation to goods	76.49	1.57
Value:		
Price given quality of goods	75.78	0.86
Price given level of service	76.73	1.81

As can be seen from table 8.3, some improvements can be made although they are not as significant as those made from World Congress data. The largest increase has occurred from increasing what the respondents think about the capability of the YPO staff.

South Yorkshire Police, 1998, Part 12

The Yorkshire Purchasing Organisation (YPO) data produces the path co-efficient diagram as can be seen in figure 8.14.

Figure 8.14 - South Yorkshire Police, 1998, path co-efficient diagram



If the aim is to increase the customer satisfaction score by 5 index points then following the same process as the World Congress above, it is therefore necessary to increase the latent variable of quality by just over 20 index points

Individual Distributions

Table 8.4 shows how much the customer satisfaction score would improve if a one point increase in the mean of a particular manifest variable was carried out. The original customer satisfaction index score was 58.78.

Table 8.4 - Improvements in the mean of a manifest variable (SYP, 1998)

Manifest Variable	Customer Satisfaction Score after increasing the manifest variable mean by '1'	Increase in index score of:
<i>Quality:</i>		
Police Politeness	60.02	1.24
Police Helpfulness	59.24	0.46
Police Efficiency	59.86	1.08
<i>Value:</i>		
Value for money	65.29	6.51

As can be seen, an increase of one on the mean of the manifest variables feeding the quality latent variable has quite a small effect on the customer satisfaction index score. However, an increase of one point on the mean of the value for money manifest variable brings about a 6.5 increase in the customer satisfaction index score.

Throughout the different experiments with the manifest variables an increase of one has brought about different outcomes on the customer satisfaction score across the different data sets. Two different issues have an effect on how much or how little the increase in the manifest variable has on the customer satisfaction index score.

Firstly, the value of the weight of each manifest variable effects by how much the corresponding latent variable index score is increased. Secondly the strength of the path co-efficients linking the latent variables together has an effect on how much of the increase is carried through the model to the latent variable of customer satisfaction.

8.5 Conclusion

The customer satisfaction seeker approach brings together all the strands of the research and allows the user of the index approach to see what the implications of improving a particular area of a service will have on the overall customer satisfaction index score. In the future it is anticipated that this approach will be computerised allowing easier access and analysis of the results. Thus enabling the optimum improvements to be identified easily and simply.

Chapter 9 - Conclusions and Further Study

9.1 Comparison of the different data sets

Over the course of this research a number of different data sets have been used to look at the benefits of an index approach. In 'Chapter 1 - Introduction', one of the outlined benefits of the index approach was the possibility of comparing organisations over time, organisations within industries and across sectors. The data sets used throughout the project allow these comparisons to be made. Table 9.1 shows how the different data sets compare for each of the latent variables in the Sheffield Model.

Table 9.1 - Comparison of the different data sets

Data Set	Latent Variable Index Scores				
	Expectations	Perceived Quality	Perceived Value	Customer Satisfaction	Loyalty
SYP, 1997	58.8	74.3	55.8	66.0	47.6
SYP, 1998 Part 12	65.4	72.9	55.1	58.8	71.4
SYP, 1998 Part 3	58.2	67.7	52.8	53.3	51.6
YPO, 1997	76.0	81.7	75.5	74.9	74.7
TQM, 1998	69.7	72.3	69.1	62.8	59.1
TQM, 1999	69.7	64.8	62.3	56.3	57.4

As can be seen the index results vary over the different data sets, and on some occasions over time for the same organisation. The three South Yorkshire Police (SYP) surveys did not look at the same areas of SYP activity. The 1997 survey looked at a limited area (districts H and J), while the 1998 studies both looked at South Yorkshire as a whole. The 1997 study looked at domestic burglary and car crime, while the 1998 part 12 looked at commercial burglary and the 1998 part 3 looked at domestic burglary.

The differences in the police index scores can to some extent be explained by the different areas of activity that were measured. The loyalty score for commercial burglary was far higher than for domestic burglary. This can be explained in a number of different ways. It could be the case that the police have a better response time to commercial burglary than for domestic and treat the people differently than if they were at home. It could also be due to the fact that in

general people are far less emotive when dealing with a burglary at their place of work when compared to there place of residence.

Further differences in the scores across the different data sets can also be explained by differences in the measuring instrument. Over the course of the research, the questionnaire has become more focused and more specific in the way it asked its questions. For example, a question in the YPO questionnaire asked generally about the capability of staff. In the World Congress questionnaire this had become more focussed and asked three different questions regarding the people involved with the conference. Thus giving more accurate feedback if one particular area is failing in relation to the others.

For various reasons, the different data sets had different sample sizes. This does effect the results as the World Congress 1999 data set in particular did have a smaller size as a percentage of the total than the previous years. This to some extent was due to the surveying technique employed in 1999, which did not allow for a reminder letter to be sent to delegates in order to increase the total number of returns.

These various aspects need to be kept in mind when comparing the data.

Comparisons of the ACSI model

Similar comparisons were carried out for the ACSI model. The results of these can be seen in table 1, appendix 30. The ACSI model is the only one of the three to contain complaints. The complaints scores can be a little mis-leading and should be interpreted differently to all the other index scores. That is to say that the higher the complaints index score, the better. Interestingly, the YPO has the lowest complaints score of all the organisations surveyed, but is higher in all other areas of measurement.

This is due to the fact that a larger percentage of the YPO's customers felt that they had cause for complaint than compared to the customers of the other surveyed organisations. However, the causes of complaint against YPO were usually around length of time for delivery. Delivery times were stated on order of goods but, were deemed to be too long by some of its customers. While this is an issue that YPO need to address for the future, it does not seem to have an effect on their customer satisfaction index scores.

In addition, the environment under which the YPO operates works in their favour. Their public sector, almost monopolistic status and pricing policies make it very difficult for their customers to go elsewhere.

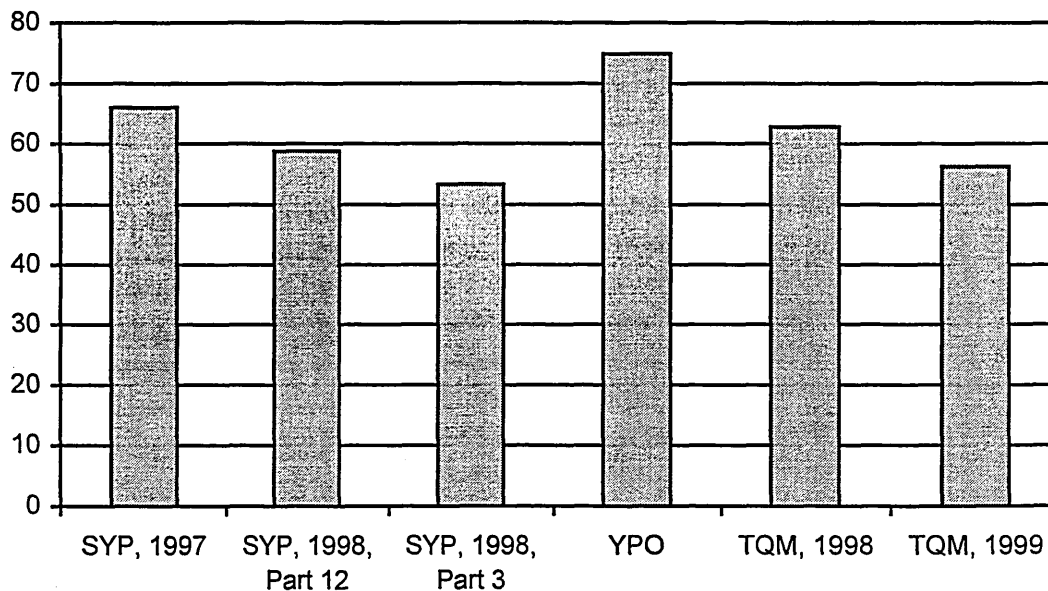
Comparisons of the ECSI Model

The ECSI model had a different structure to the other two in that it contained four exogenous latent variables as opposed to one. It also included the latent variable of image and split quality into two distinct parts, hard and soft. Even though the structure was quite different the actual customer satisfaction index scores that it produced were not significantly different from those generated by the other two models.

Comparisons of Customer Satisfaction Index Scores

The histogram in figure 9.1 looks exclusively at the customer satisfaction index scores for each of the data sets.

Figure 9.1 - Customer satisfaction index scores



The YPO (Yorkshire Purchasing Organisation) customer satisfaction index score is by far the highest from these data sets. With regard to the other data sets, quite a large variation occurred over time.

Over six index points separate the two TQM customer satisfaction index scores. However, this gap is reduced to less than two index points when the loyalty scores are compared. If the rest of the latent variable index scores are compared for the two TQM data sets it can be seen that the expectations scores of the respondents were very similar. However the respondents scored both the quality and value for money of the 1998 conference as been higher than for 1999, which explains the fall in the customer satisfaction score.

In the case of SYP, the three data sets seem to follow a similar pattern with the quality and value for money scores falling, which in turn contributes to the fall in the customer satisfaction score. However, the loyalty scores do not seem to follow this pattern and in fact the SYP 1998, part 12 score seems quite large considering the 1997 loyalty score. This can be explained by the environment in which SYP work. The people of South Yorkshire do not have a choice in dealing with SYP for their policing requirements. Therefore, it is difficult to ask the usual loyalty type questions, of 'will you use the service again?', and, 'would you recommend the service to a friend?' (see *Chapter 3 - Methodology, A Customer Satisfaction Index*, for more details). The questions therefore are not as strong as in the case of the YPO and the TQM conference.

The loyalty scores for the SYP data sets can be further discounted when the R^2 value for each are considered. The highest R^2 value of the three data sets is only 0.24, which shows that the previous model only accounts for 24% of the variation in the loyalty latent variable. The R^2 value for the other two SYP data sets are lower still.

9.2 Further Study

As part of continuously improving the index approach, there are a number of areas, which could be improved upon for the future. These are outlined below:

- **The Questionnaire**

For the future, further developments for the questionnaire are planned. However, these would be minor in nature and will not affect the structure of the questionnaire. More work is required particularly for the questionnaires used in the public sector. Experimentation is required with questions that use an alternative approach. For example in the value latent variable, questions that ask about how safe the police make you feel might be more appropriate than those that ask about value for money. Likewise, in a health related study it might be more appropriate to ask a question about quality of life.

- **The Model**

Throughout this project the model structures of three different models have been proved to work successfully. However, the further away that one moves from the public sector the more problems that are experienced. At present these problems are viewed as being problems with the questionnaire, and obtaining questions that fit the model structure as defined by the private sector. In the future, it might be appropriate to experiment with model structures, which are slanted towards the public sector. This might involve the removal of the latent variable of 'value', or renaming it so that its emphasis is 'quality of life'.

Likewise, the latent variable of loyalty could also be considered for possible changes, although in the current climate of more choice for the customer and privatisation in many current areas of the public sector, this problem might to some extent fix itself.

- **Computerised data entry**

For the future there are a number of different methodologies that might be used in order to either speed up the data entry or data collection methods or as a means of ensuring that the data collected is of the highest quality possible.

- **Speeding up the data entry**

In order to speed up the data entry process, it is likely that all questionnaires in the future will be designed so as to allow an optical scanner to read the completed forms. To allow this to happen, slight changes in the layout of the questionnaire will be required, but these will be very minor.

- **Data Collection**

It is likely that in the future data collection will be carried out by the use of telephone interviewers. This is the technique currently employed by the ACSI project in the United States. A number of different benefits will be realised through adopting this approach. Firstly, the chances for non-response to a particular question should be decreased as a respondent will not be able to miss a question through oversight. Secondly, the overall time for completing a data set should be significantly reduced. At the present time the system of a postal survey with a follow up reminder letter can take anywhere up to six weeks to complete. At the end of this time it might be found that not enough questionnaires were returned, so further questionnaires must be posted, which in turn brings about further delays. By the use of a telephone based system, this will allow the number of completed questionnaire to be monitored, and once the required number have been achieved, cleaning and analysis of the data will be able to begin.

A further advantage to using the telephone system is that if the systems are set up and put in place it will be possible for the interviewers to carry out the data entry directly onto the computer systems rather than onto paper questionnaires which require data entry. Thus another step of the process can be removed, saving both time and cost.

- **Optimisation Programme (Customer Satisfaction Seekers Approach)**

For the future a more detailed and automated way of assessing which areas of the model need improvement in order to bring about an improvement in the customer satisfaction index score needs to be developed. While it is possible to assess the impact of an increase in an individual manifest or latent variable, this does not tell the organisation the optimal solution and combination of improvements required.

Therefore, for the future a computer programme that is capable of calculating this information would be desirable.

9.3 Conclusion \ Summary of the Research

The realisation that customer satisfaction is the best scorecard for measuring delivered customer value presents management in any business with a constant challenge (Naumann & Giel, 1995).

The research as presented in this thesis is a means to measuring and monitoring customer satisfaction. It is an effective tool for meeting the constant challenge as faced by business and the public sector. This research has for the first time comprehensively measured the performance of conferences and their ability to provide delegates with what they want. It has also provided the police with a suitable model to consider their overall worth to the local community over time.

The Models

The three structural models used in the research all have different backgrounds. The ACSI model traces its routes back to the work carried out in Sweden, when the same model was used in measuring the Swedish Customer Satisfaction Barometer. The ECSI model was a model created by a team of European wide academics who are looking at developing a customer satisfaction index across the European Union. The third model was the Sheffield Model. This is a model that was created as a direct result of this research.

Throughout the research the three models have been used for analysing the different data sets. Each model has different advantages and disadvantages built within it. The ACSI and Sheffield models are very similar in their look and execution. However, the latent variable of complaints that the ACSI includes has proved a problematic area to model. Any complaint made against an organisation is useful, as it shows the organisation where it is failing its customers and subsequently how to improve its services. However, the percentage of people with cause for complaint and who actually lodge a complaint is very small, meaning that the information collected cannot be used for analysis as the PLS methodology requires complete lines of data (see '*Chapter 3 - Methodology, A Customer Satisfaction Index*'). Therefore, while information about the number of people who felt that they had cause for complaint is useful, from a modelling point of view it does not add value. In fact, the ACSI model is moving towards the European approach of not including complaints in its model.

The ECSI model includes the further latent variable of image, and splits the quality latent variable into soft and hard. While there are benefits in having quality split into two it can cause problems with some organisations. In the case of the police hard quality questions were not

included as it would have meant asking questions about the state of police cars and stations. This was not deemed to be in the interests of the research and was therefore ignored.

Likewise, there are many service industries and organisations where asking about the hard quality aspects could be seen to be irrelevant.

The latent variable of image worked well from a modelling point of view. However, it can be argued a score related to the image of an organisation is not always relevant to the organisation. Is image in fact a hybrid of loyalty? As far as an organisation is concerned if a person is loyal and comes back for more of their services they have succeeded. The other latent variable scores with the possible exception of expectations also show how well the organisation is performing. The quality score shows everyone the level of the quality within the organisation, the value scores shows how well priced the products and services are, while the customer satisfaction score gives an overall impression of how well the customer was treated. The image index score does not add any real value to the overall model as do the other latent variables.

The ECSI model does not include the latent variable of complaints either, further supporting its removal from a customer satisfaction structural model.

Therefore, the Sheffield model would seem to offer the best all round performance across both the public and private sectors for its simplicity and reliability.

The Questionnaire

In order to collect the data a generic questionnaire has been developed. Depending upon the particular industry being surveyed it might be necessary to add or drop question accordingly, however, the main elements are in place for measuring a customer satisfaction index. The benefit that this questionnaire brings is that any industry, or sector, can be surveyed by adding, or dropping, one or two questions. In the case of switching between the public and private sectors it may be necessary to substitute some questions particularly in the areas of value for money.

Public and Private Sectors

In general, the index approach works better in the private sector. Problems experienced with the SYP surveys have shown that for some of the latent variables, regardless of model used it is not possible to ask more than one question, and even then it may have to be fabricated to some

extent. The latent variable of value caused a number of problems as people do not pay directly for the services that they receive from SYP. A question therefore had to be fabricated that included the amount taken from the average council tax bill to fund the police and the respondent was then asked to comment if they thought they were receiving good or bad value for money. By having only one question feeding the value for money latent variable the index score is artificially effected as the weight that is calculated for it is always '1', rather than being influenced by other factors from within the model.

In future studies experimentation could be carried out with other types of questions, which do not look directly at the monetary aspects of value, but instead look at value from another angle. For example, quality of life type questions might be more appropriate, such as 'How safe do the police make you feel?'

Likewise, the loyalty latent variable caused similar problems as people did not have a choice but to return to the police for future services.

The Index

The main benefits of an index approach over its rivals is through the presentation and simplicity of its results. At a basic level the index score between one and a hundred allows all to see just how good or bad an organisation is performing. This score is easily compared with other organisations or national or industrial averages. The rating out of one hundred also brings added benefits. The sensitivity of the index score also allows for useful comparisons. An index, which scored between one and ten, would not allow meaningful comparisons to occur, as many organisations would share the same value.

Throughout this research it has been shown that while customer satisfaction is an integral part of Total Quality Management, it is also an area open to special attention and individual measurement. The index approach provides an organisation with a means of monitoring its own levels of customer satisfaction over time and indeed against others. However, it also provides them with the opportunity to see which areas of their service are failing and where they need to make improvements. It has the added benefit of being able to show them how much effort is required in a particular area to bring about a particular gain in the customer satisfaction index score.

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Appendices

Appendix 1 - Implementation of PLS

The information in this appendix will explain how to implement the Partial Least Squares methodology.

Implementation of Partial Least Squares (PLS)

"PLS is a second generation multivariate analysis technique used to estimate the parameters of causal models. PLS embraces abstract and empirical variables simultaneously, and recognises the interplay of these two dimensions of theory development. "The causal modelling technique, often termed structural equation modelling, accommodates a priori knowledge derived from theory and / or previous empirical findings, and because these methods can combine as well as confront theory with empirical data, they offer a potential for scientific explanation that goes far beyond description and empirical association" (Igbaria et al., 1995).

The PLS technique as has already been mentioned was used for the calculation of the weights which were then used for calculating the index scores. The version of PLS that I used, was one that had been specifically written for the SAS package by Ching. This therefore allowed the full benefits of the SAS statistical package to also be used when running the model.

The PLS.SAS programme was fairly straightforward to use. After loading the programme into the SAS programme editor there were a number of lines that needed to be changed in order to make the programme executable.

The first line of the programme needed to be changed to include the name of the data set that the model was to run. This name was in turn defined when the data set was imported into the SAS package using the built in SAS 'wizard'.

At the end of the PLS programme are a number of lines which allow the use to define the SEM. Below can be seen an example of these lines:

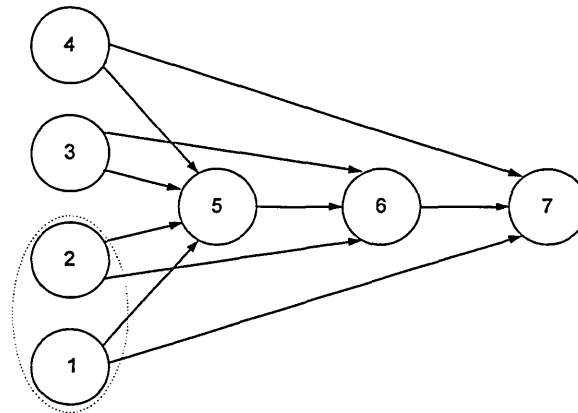
```

n={2 2 3 3 2 4 2};
ir={5 1 2 3 4 6 2 3 4 7 1 4 6};
irn={5 4 4};
io={1 1 1 1 1 1 0};
ssize=100;
maxnoit=100;
criterio=0.000001;
fpopt=0;
fpcrit=0.000001;
nfpit=100;

```

To aid the understanding of these lines figure 1 shows the model and how they relate to each other. The lines 'ir' and 'irn' are both specific to the model structure, while line 'n' defines the input data, and line 'io' defines whether or not a latent variable influences 'in' or 'out'.

Figure 1 - Customer Satisfaction Index (European Model)



The different commands at the beginning of each line, define a different part of the model.

- n** this line defines how many variables will feed into each latent variable of the SEM. For example, 2 variables (questions) into latent variable 1, 2 variables into latent variable 2 etc.
- ir** indicates which variables are involved as dependant and independent variables for each inner relation. For example, the first part of the line (5 1 2 3 4) indicates that latent variable 5 is fed by latent variables 1,2,3 and 4.

irn	determines how many variables there are in each inner relation. For example, the 5, indicates that there are four latent variables feeding into 'latent variable 5' plus the latent variable itself making 5. Likewise the 4, indicates that there are 3 latent variables feeding into 'latent variable 6' plus the latent variable itself making 4.
io	indicates whether the outer indicators go in or out for each variable in the inner relations. One (1) means in, while zero (0) means out.
ssize	This is the sample size, or the number of completed questionnaires used in the study.
maxnoit	This is the maximum number of iterations for the PLS procedure to carry out before ceasing.
citerio	This is the converge criterion. Iteration stops when all coefficients estimates converge to with CTITERIO
fpopt	When the inner relations form an interdependent system, you have the following options. fpopt = 0 The fix point is not exercised fpopt = 1 The first step in the FP iteration is OLS fpopt = 2 The first step in the FP iteration is 2SLS

PLS.SAS documentation

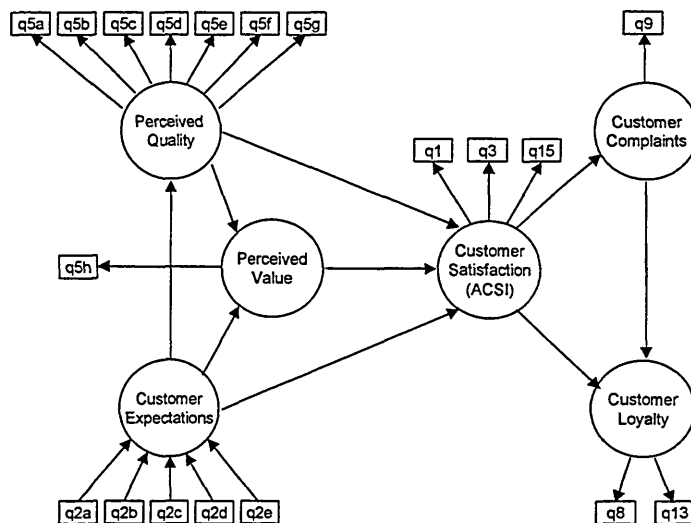
The PLS Equations

This section will explain the statistical background to the PLS methodology when applied to the SEM.

The source for the equations expressed in this section can be found in "The American Customer Satisfaction Index (ACSI) Methodology (1994). The words in *italics* are direct quotation from the same source. The words in standard script are mine. The ACSI equations have been used as a guide with the actual matrices that appear being those for the 1998 TQM World Congress data, which are used as an example for illustration purposes.

Figure 2 shows the ACSI model with the relevant TQM World Congress variables (see 'Chapter 7 - Private Sector Case Studies', for a complete breakdown of the results).

Figure 2 - ACSI model including the TQM World Congress variables



The ACSI Model

The formal expression of the model depicted in the diagram above can be written as a series of equations estimated by Partial Least Squares (PLS). The systematic part of the predictor relationships is the conditional expectation of predictands for given values of predictors.

General equation is specified as stochastic:

$$E[\eta|\eta, \xi] = B\eta + \Gamma\xi$$

(E = The expected value)

where $\eta' = (\eta_1, \eta_2, \dots, \eta_m)$ and $\xi' = (\xi_1, \xi_2, \dots, \xi_n)$ are vectors of the unobserved endogenous and exogenous variables, respectively, $B(m \times m)$ is a matrix of coefficient parameters for η , and $\Gamma(m \times n)$ is a matrix of coefficient parameters for ξ . This implies that $E[\eta\zeta'] = E[\xi\zeta'] = E[\zeta\zeta'] = 0$, where $\zeta = \eta - E[\eta|\eta, \xi]$.

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ \beta_{21} & 0 & 0 & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 & 0 & 0 \\ 0 & 0 & \beta_{43} & 0 & 0 \\ 0 & 0 & \beta_{53} & \beta_{54} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \end{bmatrix} + \begin{bmatrix} \gamma_{11} \\ \gamma_{21} \\ \gamma_{31} \\ 0 \\ 0 \end{bmatrix} \zeta + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \\ \zeta_5 \end{bmatrix}$$

where

- ζ = Customer Expectation
 η_1 = Perceived Quality
 η_2 = Perceived Value
 η_3 = American Customer Satisfaction Index (ACSI)
 η_4 = Customer Complaints
 η_5 = Customer Loyalty

This matrix defines the structure of the model, whereby the row of '0' after the η_1 indicates that this latent variable is not fed by any other endogenous latent variable.

In the second line of the matrix $\eta_2 = (\beta_{21} \ 0 \ 0 \ 0 \ 0)$, the β_{21} indicates that the latent variable of perceived value is fed by the latent variable of perceived quality. The table below explains more clearly what each position of the matrix refers to.

	Quality	Value	CS	Complaints	Loyalty
η_1 (Quality)	0	0	0	0	0
η_2 (Value)	β_{21}	0	0	0	0
η_3 (Satisfaction)	β_{31}	β_{32}	0	0	0
η_4 (Complaints)	0	0	β_{43}	0	0
η_5 (Loyalty)	0	0	β_{53}	β_{54}	0

Read across then down.

The '0' indicates no relation.

The β indicates where there is a relationship. For example, β_{21} indicates a relationship from quality to value.

The matrix $\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \end{bmatrix}$ is repeated on the right hand side because PLS is an iterative process and

therefore, the answers from one iteration are used in calculating the next iteration.

The matrix $\begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ 0 \\ 0 \end{bmatrix}$ indicates which endogenous latent variables are fed by, the exogenous

latent variable (expectations).

The general equations for relating the latent variables to empirical variables are:

$$y = \Lambda_y \eta + \varepsilon$$

$$x = \Lambda_x \xi + \delta$$

where $y'=(y_1, y_2, \dots, y_p)$ and $x'=(x_1, x_2, \dots, x_q)$ are the measured endogenous and exogenous variables, respectively. $\Lambda_y(p \times m)$ and $\Lambda_x(q \times n)$ are the corresponding regression matrices. By implication from PLS estimation, we have $E[\varepsilon] = E[\delta] = E[\eta\varepsilon'] = E[\xi\delta] = 0$. The corresponding equations in ACSI are:

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \\ x_6 \end{bmatrix} = \begin{bmatrix} \lambda_{11} \\ \lambda_{21} \\ \lambda_{31} \\ \lambda_{41} \\ \lambda_{51} \\ \lambda_{61} \end{bmatrix} \xi + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \end{bmatrix}$$

This matrix defines how the variables (questions) attached to the exogenous latent variable (in this case, expectations) feed into the SEM.

and

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \\ y_6 \\ y_7 \\ y_8 \\ y_9 \\ y_{10} \\ y_{11} \\ y_{12} \\ y_{13} \end{bmatrix} = \begin{bmatrix} \lambda_{11} & 0 & 0 & 0 & 0 \\ \lambda_{21} & 0 & 0 & 0 & 0 \\ \lambda_{31} & 0 & 0 & 0 & 0 \\ \lambda_{41} & 0 & 0 & 0 & 0 \\ \lambda_{51} & 0 & 0 & 0 & 0 \\ \lambda_{61} & 0 & 0 & 0 & 0 \\ 0 & \lambda_{12} & 0 & 0 & 0 \\ 0 & 0 & \lambda_{13} & 0 & 0 \\ 0 & 0 & \lambda_{23} & 0 & 0 \\ 0 & 0 & \lambda_{33} & 0 & 0 \\ 0 & 0 & 0 & \lambda_{14} & 0 \\ 0 & 0 & 0 & 0 & \lambda_{15} \\ 0 & 0 & 0 & 0 & \lambda_{25} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \\ \varepsilon_7 \\ \varepsilon_8 \\ \varepsilon_9 \\ \varepsilon_{10} \\ \varepsilon_{11} \\ \varepsilon_{12} \\ \varepsilon_{13} \end{bmatrix}$$

This matrix defines how the endogenous latent variables are fed from the questions where:

x ₁	=	Expectations	-	Staff
x ₂	=	Expectations	-	Venue
x ₃	=	Expectations	-	Catering
x ₄	=	Expectations	-	Quality of Speakers
x ₅	=	Expectations	-	Relevance of Speakers
x ₆	=	Expectations	-	Overall
y ₁	=	Quality	-	Staff courtesy
y ₂	=	Quality	-	Staff helpfulness
y ₃	=	Quality	-	Staff efficiency
y ₄	=	Quality	-	Venue facilities
y ₅	=	Quality	-	Catering facilities
y ₆	=	Quality	-	Speakers
y ₇	=	Value	-	Conference price
y ₈	=	Customer Satisfaction	-	Overall satisfaction
y ₉	=	Customer Satisfaction	-	Relevance of speakers
y ₁₀	=	Customer Satisfaction	-	Comparison to ideal
y ₁₁	=	Complaints	-	Cause for complaint
y ₁₂	=	Loyalty	-	Likelihood of attending next year
y ₁₃	=	Loyalty	-	Recommend to a friend?

Although the above equations and matrices show the statistical structure for SEM, in applied work, SEM are most often represented graphically (The form of structural equation models, 1997).

The matrices for the other SEMs used (Sheffield and Europe) can be found in appendix 2.

Formula for calculating the latent variable, index scores

The general formula for calculating the index values from the weights (calculated by PLS) and means (from original data) has been used on all the different Structural Equation Models used.

The general form of the American Customer Satisfaction Index (ACSI) is as follows:

$$ACSI = \frac{E[\xi] - \text{Min}[\xi]}{\text{Max}[\xi] - \text{Min}[\xi]} \times 100$$

where ξ is the latent variable for Customer Satisfaction, and $E[.]$, $\text{Min}[.]$ and $\text{Max}[.]$ denote the expected, the minimum and the maximum value of the variable, respectively.

The minimum and maximum values are determined by those corresponding manifest variables:

$$\text{Min}[\xi] = \sum_{i=1}^n w_i \text{Min}[x_i]$$

and

$$\text{Max}[\xi] = \sum_{i=1}^n w_i \text{Max}[x_i]$$

where x_i 's are the manifest variables of the latent Customer Satisfaction, w_i 's are the weights, and 'n' is the number of manifest variables. In calculating the ACSI, unstandardised weights must be used if unstandardised manifest variables are used.

In ACSI, there are three indicators for Customer Satisfaction, which range from 1 to 10.

Then the calculation is simplified to:

$$ACSI = \frac{\sum_{i=1}^3 w_i \bar{x}_i - \sum_{i=1}^3 w_i}{9 \sum_{i=1}^3 w_i} \times 100$$

where w_i 's are the unstandardised weights.

The sum of the weights is multiplied by 9, because a 10-point scale has been used. The maximum value a respondent could award is a ten with one being the minimum value. Ten minus one, equals nine. Likewise, if a 7-point scale had being used the sum of the weights would have being multiplied by six

Example of calculations

The calculations below show an example of how the Indices are calculated. The data below was generated by the TQM World Congress, and the model used was the European Model.

Means of questions from Customer Satisfaction

Q1 = 6.645
Q5g = 6.398
Q15 = 6.500

Weights (generated by PLS)

Q1 = -0.178466
Q5g = 0.6747272
Q15 = 0.5304508

$$\begin{aligned} \sum_{i=1}^3 w_i \bar{x}_i &= (6.545 * -0.178466) + (6.398 * 0.6747272) + (6.5 * 0.5304508) \\ &= 6.5967748556 \end{aligned}$$

$$\begin{aligned} \sum_{i=1}^3 w_i &= -0.178466 + 0.6747272 + 0.5304508 \\ &= 1.026712 \end{aligned}$$

$$9 \sum_{i=1}^3 w_i = 9.240408$$

Therefore:

$$\begin{aligned} & \frac{\sum_{i=1}^3 w_i \bar{x}_i - \sum_{i=1}^3 w_i}{9 \sum_{i=1}^3 w_i} \times 100 \\ &= \left(\frac{6.5967748556 - 1.026712}{9.240408} \right) \times 100 \\ &= 60.2794038 \end{aligned}$$

Therefore, the Customer Satisfaction Index for the TQM World Congress is 60.3.

The same formula and technique is used for calculating the values for other latent variables of the model, should they be required.

Robustness of PLS

As has been mentioned earlier, the PLS methodology is fairly robust. An example of this can be seen in the table below. From the initial ACSI model using the YPO data the following results were achieved when a number of the variables (questions) were removed.

Table 1 - The effect of removing variables from a SEM under PLS and AMOS

Change	PLS Index
No Change, Original Model	77.96
Remove q7	78.21
Remove q3	78.22
Remove q2	78.32
Remove q8	78.06
Remove q16	78.71
Remove q19	78.26
Remove q5	78.26
Remove q3, q7	78.26
Remove q2, q3, q7	78.37
Remove q2, q3, q7, q8	78.42
Remove q2, q3, q7, q8, q16	78.71
Remove q2, q3, q7, q8, q16, q19	78.72
Remove latent variable, 'Complaints'	78.02

As can be seen from the table above, very little effect is made to the Index scores by removing different variables or combinations of variables.

The overall variability of the index figures goes from 77.96 to 78.72 a difference of 0.76. In terms of accuracy, a 500-sample questionnaire should report an index to within plus or minus 1.8 of the true value. A change, say, of 2 points in an index score should be viewed as a significant change and further analysis conducted (REFERENCE, ???). Therefore, with the smaller sample size of the YPO this relatively small variation can in itself be taken as very significant, as it would be expected that smaller sample sizes would see greater variability than large ones. Therefore, the relatively small variability in the Index score, shows the robustness of the PLS methodology.

In addition to these observations, other simulation studies have also produced the same conclusions, that the PLS methodology is robust. A study by Hackl et. al. (1999) looked at the robustness of PLS against

- Skewed distributions
- Correlated manifest variables
- Mis-specification of inner structure
- Reliability of manifest variables
- Scaling of manifest variables

it also looked at the asymptotic properties of PLS.

The conclusions of the work by Hackl et. al. (1999) stated that the indices it produced in their study were extremely robust.

Problems arising from the use of PLS

A number of problems arose with the use of PLS. Most of these were quite minor and did not effect the use of the package for the research.

By having only one manifest variable feeding a latent variable caused problems. This is a problem that occurred exclusively in the public sector questionnaires where the customer does not directly pay for the services that they are receiving. The latent variable of 'Value', in particular caused a number of problems due to customers not directly paying for the service that they receive, or, in the case of South Yorkshire Police, customers did not have a choice of the organisation they used for a service. Therefore, this resulted in only having one question feeding a particular latent variable.

When PLS executed the model, it assigned latent variables with only one variable a weight of '1'. This allowed calculation for that particular dimension to be made, but if alterations were made to the model and the model executed again, the weighting for the latent variable with only one question remained the same at '1'. Whereas, for latent variables with more than one question feeding in, the weightings would change, thus effecting the index totals. The index total for the latent variable 'Value', would often remain completely unchanged during experimentation, while the other index totals would vary slightly.

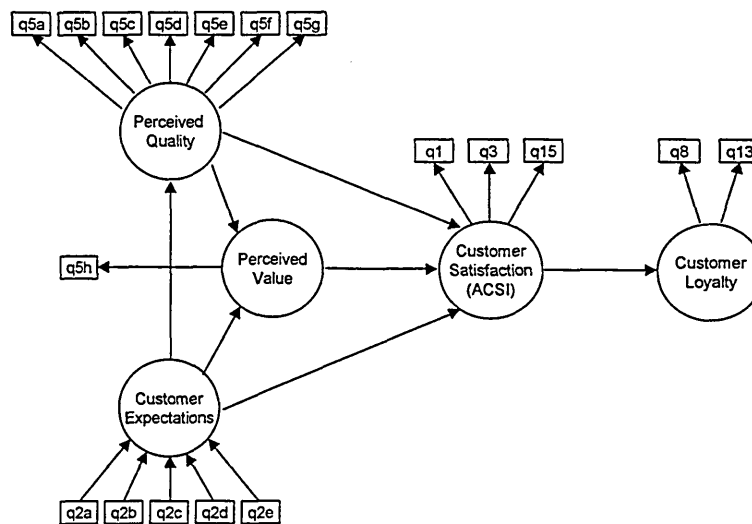
It should be noted that although the other dimensions totals would vary, it was usually only very slightly (the decimal part) and usually within + or - 1 index point.

Appendix 2 - Matrices for the Sheffield Model

This appendix contains the matrices which describe the PLS model structure and assignment of the manifest variables (questions) to the latent variables for the Sheffield Structural Equation Model. This example uses the 1998 TQM World Congress data.

Figure 1 shows how the variables (questions) were assigned to the SEM.

Figure 1 - The Sheffield Model



The model structure matrices:

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ \beta_{21} & 0 & 0 & 0 \\ \beta_{31} & \beta_{32} & 0 & 0 \\ 0 & 0 & \beta_{43} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \\ 0 \end{bmatrix} \zeta + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix}$$

where:

- ξ = Customer Expectation
- η_1 = Perceived Quality
- η_2 = Perceived Value
- η_3 = American Customer Satisfaction Index (ACSI)
- η_4 = Customer Loyalty

Assigning the variables (questions) to the exogenous variables:

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \\ x_6 \\ x_7 \end{bmatrix} = \begin{bmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \\ \lambda_4 \\ \lambda_5 \\ \lambda_6 \\ \lambda_7 \end{bmatrix} \xi + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \\ \delta_7 \end{bmatrix}$$

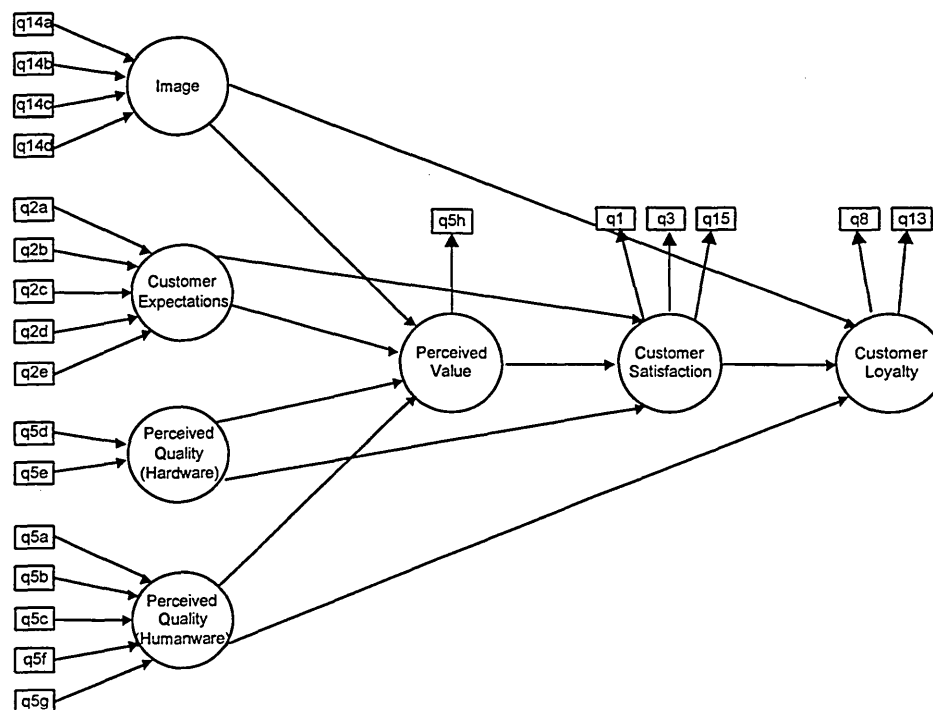
Assigning the variables (questions) to the endogenous variables:

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \\ y_6 \\ y_7 \\ y_8 \\ y_9 \\ y_{10} \\ y_{11} \\ y_{12} \end{bmatrix} = \begin{bmatrix} \lambda_{11} & 0 & 0 & 0 \\ \lambda_{21} & 0 & 0 & 0 \\ \lambda_{31} & 0 & 0 & 0 \\ \lambda_{41} & 0 & 0 & 0 \\ \lambda_{51} & 0 & 0 & 0 \\ \lambda_{61} & 0 & 0 & 0 \\ 0 & \lambda_{12} & 0 & 0 \\ 0 & 0 & \lambda_{13} & 0 \\ 0 & 0 & \lambda_{23} & 0 \\ 0 & 0 & \lambda_{33} & 0 \\ 0 & 0 & 0 & \lambda_{14} \\ 0 & 0 & 0 & \lambda_{24} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \\ \varepsilon_7 \\ \varepsilon_8 \\ \varepsilon_9 \\ \varepsilon_{10} \\ \varepsilon_{11} \\ \varepsilon_{12} \end{bmatrix}$$

where

x_1	=	Expectations	- Staff
x_2	=	Expectations	- Venue
x_3	=	Expectations	- Catering
x_4	=	Expectations	- Quality of Speakers
x_5	=	Expectations	- Relevance of Speakers
x_6	=	Expectations	- Overall
x_7	=	Complaints	- Cause for complaint
y_1	=	Quality	- Staff courtesy
y_2	=	Quality	- Staff helpfulness
y_3	=	Quality	- Staff efficiency
y_4	=	Quality	- Venue facilities
y_5	=	Quality	- Catering facilities
y_6	=	Quality	- Speakers
y_7	=	Value	- Conference price
y_8	=	Customer Satisfaction	- Overall satisfaction
y_9	=	Customer Satisfaction	- Relevance of speakers
y_{10}	=	Customer Satisfaction	- Comparison to ideal
y_{11}	=	Loyalty	- Likelihood of attending next year
y_{12}	=	Loyalty	- Recommend to a friend?

Figure 2 - The European Model



The model structure matrices:

$$\begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ \beta_{21} & 0 & 0 \\ 0 & \beta_{32} & 0 \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} \\ 0 & \gamma_{22} & \gamma_{23} & 0 \\ \gamma_{31} & 0 & 0 & \gamma_{34} \end{bmatrix} \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \\ \zeta_4 \end{bmatrix} + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \end{bmatrix}$$

where:

- ξ_1 = Human Quality
- ξ_2 = Hardware Quality
- ξ_3 = Perceived Expectations
- ξ_4 = Image
- η_1 = Perceived Value
- η_2 = American Customer Satisfaction Index (ACSI)
- η_3 = Customer Loyalty

Assigning the variables (questions) to the exogenous variables:

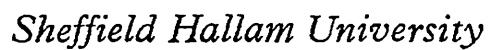
$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \\ x_6 \\ x_7 \\ x_8 \\ x_9 \\ x_{10} \\ x_{11} \\ x_{12} \\ x_{13} \\ x_{14} \\ x_{15} \\ x_{16} \\ x_{17} \end{bmatrix} = \begin{bmatrix} \lambda_{11} & 0 & 0 & 0 \\ \lambda_{21} & 0 & 0 & 0 \\ \lambda_{31} & 0 & 0 & 0 \\ \lambda_{41} & 0 & 0 & 0 \\ 0 & \lambda_{12} & 0 & 0 \\ 0 & \lambda_{22} & 0 & 0 \\ 0 & 0 & \lambda_{13} & 0 \\ 0 & 0 & \lambda_{23} & 0 \\ 0 & 0 & \lambda_{33} & 0 \\ 0 & 0 & \lambda_{43} & 0 \\ 0 & 0 & \lambda_{53} & 0 \\ 0 & 0 & \lambda_{63} & 0 \\ 0 & 0 & \lambda_{73} & 0 \\ 0 & 0 & 0 & \lambda_{14} \\ 0 & 0 & 0 & \lambda_{24} \\ 0 & 0 & 0 & \lambda_{34} \\ 0 & 0 & 0 & \lambda_{44} \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \\ \delta_7 \\ \delta_8 \\ \delta_9 \\ \delta_{10} \\ \delta_{11} \\ \delta_{12} \\ \delta_{13} \\ \delta_{14} \\ \delta_{15} \\ \delta_{16} \\ \delta_{17} \end{bmatrix}$$

Assigning the variables (questions) to the endogenous variables:

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \\ y_6 \end{bmatrix} = \begin{bmatrix} \lambda_{11} & 0 & 0 \\ 0 & \lambda_{12} & 0 \\ 0 & \lambda_{22} & 0 \\ 0 & \lambda_{32} & 0 \\ 0 & 0 & \lambda_{13} \\ 0 & 0 & \lambda_{23} \end{bmatrix} \begin{bmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \end{bmatrix}$$

where:

x_1	=	Human Quality	-	Staff courtesy
x_2	=	Human Quality	-	Staff helpfulness
x_3	=	Human Quality	-	Staff efficiency
x_4	=	Hardware Quality	-	Venue facilities
x_5	=	Hardware Quality	-	Catering facilities
x_6	=	Human Quality	-	Speakers
x_7	=	Expectations	-	Staff
x_8	=	Expectations	-	Venue
x_9	=	Expectations	-	Catering
x_{10}	=	Expectations	-	Quality of speakers
x_{11}	=	Expectations	-	Relevance of speakers
x_{12}	=	Expectations	-	Overall
x_{13}	=	Complaints	-	Cause for complaint
x_{14}	=	Image	-	Professional
x_{15}	=	Image	-	User friendly
x_{16}	=	Image	-	Academic
x_{17}	=	Image	-	Applicable to business
y_1	=	Value	-	Conference price
y_2	=	Customer Satisfaction	-	Overall satisfaction
y_3	=	Customer Satisfaction	-	Relevance of speakers
y_4	=	Customer Satisfaction	-	Comparison to ideal
y_5	=	Loyalty	-	Likelihood of attending next year
y_6	=	Loyalty	-	Recommend to a friend?



- 12) How satisfied were you with the way the incident (not the eventual outcome) was handled?

1 2 3 4 5 6 7 8 9 10
 Very Dissatisfied Very Satisfied

Now go to question 15)

- 13) In your opinion, did you have to wait long before you were served by the counter staff at the police station?

1 2 3 4 5 6 7 8 9 10
 Long Wait Short Wait

- 14) How satisfied were you with the way your enquiry (not the eventual outcome) was handled?

1 2 3 4 5 6 7 8 9 10
 Very Dissatisfied Very Satisfied

- 15) Thinking back to the incident. How would you rate the police's attitude towards you? Would you have said that they were helpful or unhelpful?

1 2 3 4 5 6 7 8 9 10
 Very Unhelpful Very Helpful

- 16) Please consider all your experiences up to date with the SYP. How satisfied are you with the overall service provided by SYP?

1 2 3 4 5 6 7 8 9 10
 Very dissatisfied Very satisfied

- 17) During the last year, how many times (if any) have you been less than satisfied with SYP services?

number

If '0', go to question 20)

18) Broadly, what were these issues about?

19) During the last year, if you have been less than satisfied with the SYP, have you raised this as an issue with the police?

Yes 1
No 2

If yes, how would you rate the way in which the complaint was handled?

1 2 3 4 5 6 7 8 9 10
Very poorly Very well

20) In the last year, how many times have you received service from SYP with which you have been pleased? (If none (0), go to question 22).

number

21) When you have had an experience that has pleased you, with how many people have you discussed it?

number

22) In the last year, how many times have you received service from SYP which has upset you? (If none (0), go to question 24).

number

23) When you have had an experience that has upset you, with how many people have you discussed it?

number

- 24) If you can imagine an ideal police force, how well do you think SYP compares with this ideal police force?

1 2 3 4 5 6 7 8 9 10
Unfavourable Favourable

- 25) Are there any areas or issues connected with the Police in South Yorkshire you would like to make further comments about? (If you require more space please write on the back)

.....
.....
.....

Personal Details

In order for us to know a little about the type of people who are answering these questions, please could you complete the following section

- 1) How old are you?

Under 18	1	46 - 55	5
18 - 25	2	56 - 65	6
26 - 35	3	66 - 75	7
36 - 45	4	Over 75	8

- 2) Are you:

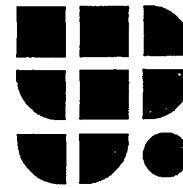
Employed full-time	1	Student	5
Employed part-time	2	Retired	6
Registered unemployed	3	Self employed	7
Un-waged, not registered unemployed (includes looking after home/family)	4	Other	8

- 3) Finally, which ethnic group do you consider yourself to be part of?

White	1	Pakistan	6
Indian	2	Bangladeshi	7
Black -Caribbean	3	Chinese	8
Black-African	4	Other	9
Black (other)	5	Please Specify
Please Specify		

These categories are approved by the Commission for Racial Equality.

Thank you for your time and providing details about South Yorkshire Police.
All information will be treated in the strictest confidence



- 6) How important to you is quality in relation to the service (not goods) provided by YPO?

1 2 3 4 5 6 7 8 9 10
 Very low Very high

- 7) How important to you is quality in relation to the goods (not services) provided by YPO?

1 2 3 4 5 6 7 8 9 10
 Very low Very high

- 8) If you were to compare YPO against other suppliers of similar goods, how would you rate the price you pay for goods (not service)?

1 2 3 4 5 6 7 8 9 10
 Very high price Very low price
 given quality given quality

- 9) If you were to compare YPO against other suppliers of similar goods, how would you rate the price you pay in relation to the level of service that you receive?

1 2 3 4 5 6 7 8 9 10
 Very high price Very low price
 given quality given quality

- 10) The next time you require products that are available in the YPO catalogue, how likely is it that you will buy them from YPO?

1 2 3 4 5 6 7 8 9 10
 Very unlikely Very likely

- 11) Are YPO the main supplier of goods to your school?

Yes 1
 No 2

- 12) Please consider all your experiences up to date with YPO. How satisfied are you with the overall service provided by YPO?

1 2 3 4 5 6 7 8 9 10
 Very dissatisfied Very satisfied

- 13) During the last year, how many times (if any) have you been less than satisfied with YPO services?

number

If '0' go to question 16)

- 14) Broadly, what were these issues about?

- 15) During the last year, if you have been less than satisfied with YPO have you raised this as an issue with YPO?

Yes 1
 No 2

If yes, how would you rate the way in which the complaint was handled?

1 2 3 4 5 6 7 8 9 10
 Very poorly Very well

- 16) In the last year, how many times have you received service from YPO with which you have been pleased? (If none (0), go to question 18).

number

- 17) When you have had an experience that has pleased you, with how many people have you discussed it?

number

- 18) In the last year, how many times have you received service from YPO which has upset you? (If none (0), go to question 20).

number

- 19) When you have had an experience that has upset you, with how many people have you discussed it?

number

- 20) If you can imagine an ideal catalogue company for the supplies that you purchase, how well do you think YPO compares with this ideal company?

1 2 3 4 5 6 7 8 9 10
Unfavourable Favourable

- 21) Are there any areas or issues connected with the YPO that you would like to make further comments about?

.....
.....
.....

Personal Details

In order for us to know something about the type of people who are answering these questions, please could you complete the following section.

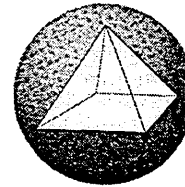
- 1) School: _____
2) Contact Name: _____
3) Position: _____
4) Telephone Number: _____
5) Approximately how many orders a year do you place with YPO?

number

Thank you for your time and providing details about the Yorkshire Purchasing Organisation.

All information will be treated in the strictest confidence.

Appendix 5 - 3rd World Congress for Total Quality Management, 1998, Questionnaire



*Business Excellence
Through Quality Culture*

Dear TQM Congress Delegate,

The goal of the World Congress of Total Quality Management is to provide our delegates with the ultimate in presentations and service. In order that we can build on the conference for next year we would like to create an index score of the success of this years conference. We would very much appreciate your co-operation in completing this questionnaire.

The majority of questions require you to tick one box per line.

<p>1) Thinking of your overall experience with the Congress, all things considered, how would you describe your experience ON THIS OCCASION? Please tick a box from the scale below.</p>										
1 Very disappointing	2	3	4	5	6	7	8	9	10 Outstanding	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>2) What were your expectations before the conference of the items below:</p>										
	1 Low Expectations	2	3	4	5	6	7	8	9	10 High Expectations
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Overall Staff Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conference Venue Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Catering Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relevance of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>3) In relation to the services that you receive from Congress, to what extent have they fallen short of, or, exceeded your expectations?</p>										
1 Falls short of expectations	2	3	4	5	6	7	8	9	10 Exceeds expectations	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

5) How satisfied were you with each of the below?

	1 Very Dissatisfied	2	3	4	5	6	7	8	9	10 Very Satisfied
Overall Staff Courtesy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Staff Helpfulness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Staff Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conference Venue Facilities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Catering Facilities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relevance of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Value of conference experience..... relative to price paid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6) Below are some other services that you may or may not have used. Please indicate how satisfied you were with each.

	Did not experience	1 Very Dissatisfied	2	3	4	5	6	7	8	9	10 Very Satisfied
Kehlam Island Social Evening.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conference Dinner (Cutlers Hall)....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coach Service between hotels, university and social gatherings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7) Thinking of your most recent previous World Congress of Total Quality Management, please tick the box which best describes your overall conference experience.

Not attended previously	1 Very Disappointing	2	3	4	5	6	7	8	9	10 Outstanding
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8) How likely is it that you will attend the 4th World Congress of Total Quality Management in 1999?

1 Very unlikely	2	3	4	5	6	7	8	9	10 Very likely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9) During the Congress, do you feel that you have had cause for complaint?

☐ Yes Please continue with question 10) ☐ No Please go to Q13

10) Broadly, what were these issues about?

11) Did you report the problem to the Congress organisers?

☐ Yes Please continue with question 12) ☐ No Please go to Q13

12) How would you rate the way in which the complaint was handled?

1 Very poorly	2	3	4	5	6	7	8	9	10 Very well
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13) Is this a conference which you would recommend to personal friends or associates? ←

☐ Yes ☐ No

14) How would you rate the image of the Congress in terms of being:

	1 Very low image	2	3	4	5	6	7	8	9	10 Very high image
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Professional.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Friendly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to Business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15) If you can imagine an ideal conference, how well do you think the Congress compares with this?

1 Unfavourably	2	3	4	5	6	7	8	9	10 Favourably
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16) Are there any other areas or issues connected with the Congress that you would like to make further comments about?

Personal Details

1) Are you male or female?

- ☐ Male
- ☐ Female

2) What age group are you in?

- | | |
|---|--|
| <input type="checkbox"/> Under 25 years | <input type="checkbox"/> 45 - 49 years |
| <input type="checkbox"/> 25 - 29 years | <input type="checkbox"/> 50 - 54 years |
| <input type="checkbox"/> 30 - 34 years | <input type="checkbox"/> 55 - 59 years |
| <input type="checkbox"/> 35 - 39 years | <input type="checkbox"/> 60 - 64 years |
| <input type="checkbox"/> 40 - 44 years | <input type="checkbox"/> 65 years and over |

3) Which of the categories below best describes your current employment status?

- ☐ Academic
- ☐ Public Sector
- ☐ Business \ Industry
- ☐ Other
Please specify _____

Thank you for providing details about the Third World Congress for Total Quality Management

All information will be treated in the strictest confidence.

Appendix 6 - South Yorkshire Police, 1998, Questionnaire



Dear South Yorkshire Police Customer,


The aim of South Yorkshire Police (SYP) is to provide the people of South Yorkshire with the best police service it possibly can. As part of this South Yorkshire Police are interested in finding out how its officers and staff treat the general public. Your help in completing this questionnaire would be greatly appreciated.

The majority of questions require you to tick one box per line.

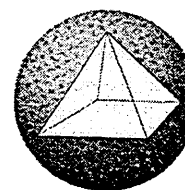
<p>1) Thinking of your overall experience with SYP, all things considered, how would you describe your experience? Please tick a box from the scale below which best describes how you feel.</p>											
1	2	3	4	5	6	7	8	9	10		
Very disappointing									Outstanding		
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>2) From your past experience of SYP, how reliable would you say SYP are in terms of:</p>											
		1	2	3	4	5	6	7	8	9	10
		Very Un - Reliable									Very Reliable
		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Speed in answering the telephone		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speed in responding to an incident		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>3) In relation to the services that you receive from SYP, to what extent have they fallen short of, or, exceeded your expectations?</p>											
1	2	3	4	5	6	7	8	9	10		
Falls short of expectations										Exceeds expectations	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<p>4) In 1998, 8.5% of the business rate tax went to pay for the police. Would you say this is low or high value for money?</p>											
1	2	3	4	5	6	7	8	9	10		
Low value for money										High value for money	
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The questions on this page all relate to the burglary that you experienced											
5) How satisfied are you with each of the items listed below?											
	1 Very Dissatisfied ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very Satisfied ↓	
Overall Police Politeness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Overall Police Helpfulness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Overall Police Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6) Below are some services that you may or may not have used. How satisfied are you with each of these?											
	Did not experience ↓	1 Very Dissatisfied ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very Satisfied ↓
999 Telephone Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Telephone Service (Not 999)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police Station Counter Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How long it took for an officer to arrive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) During the last year have you ever felt that you have had cause for complaint about SYP services?											
<input type="checkbox"/> Yes Please continue with Q8) <input type="checkbox"/> No Please go to Q11											
8) Broadly, what were these issues about?											
_____ _____ _____ _____											
9) Did you raise this as an issue with the police?											
<input type="checkbox"/> Yes Please continue with Q10) <input type="checkbox"/> No Please go to Q11											
10) How would you rate the way in which the complaint was handled?											
	1 Very poorly ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very well ↓	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The questions on this page all relate to the burglary that you experienced											
5) How satisfied are you with each of the items listed below?											
	1 Very Dissatisfied ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very Satisfied ↓	
Overall Police Politeness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Overall Police Helpfulness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Overall Police Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6) Below are some services that you may or may not have used. How satisfied are you with each of these?											
	Did not experience ↓	1 Very Dissatisfied ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very Satisfied ↓
999 Telephone Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Telephone Service (Not 999)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police Station Counter Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How long it took for an officer to arrive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) During the last year have you ever felt that you have had cause for complaint about SYP services?											
<input type="checkbox"/> Yes Please continue with Q8) <input type="checkbox"/> No Please go to Q11											
8) Broadly, what were these issues about?											
<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px;"></div>											
9) Did you raise this as an issue with the police?											
<input type="checkbox"/> Yes Please continue with Q10) <input type="checkbox"/> No Please go to Q11											
10) How would you rate the way in which the complaint was handled?											
	1 Very poorly ↓	2 ↓	3 ↓	4 ↓	5 ↓	6 ↓	7 ↓	8 ↓	9 ↓	10 Very well ↓	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Personal Details											
<p>1) Are you male or female?</p> <p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>	<p>2) What age group are you in?</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Under 25 years</td> <td><input type="checkbox"/> 45 - 49 years</td> </tr> <tr> <td><input type="checkbox"/> 25 - 29 years</td> <td><input type="checkbox"/> 50 - 54 years</td> </tr> <tr> <td><input type="checkbox"/> 30 - 34 years</td> <td><input type="checkbox"/> 55 - 59 years</td> </tr> <tr> <td><input type="checkbox"/> 35 - 39 years</td> <td><input type="checkbox"/> 60 - 64 years</td> </tr> <tr> <td><input type="checkbox"/> 40 - 44 years</td> <td><input type="checkbox"/> 65 years and over</td> </tr> </table>	<input type="checkbox"/> Under 25 years	<input type="checkbox"/> 45 - 49 years	<input type="checkbox"/> 25 - 29 years	<input type="checkbox"/> 50 - 54 years	<input type="checkbox"/> 30 - 34 years	<input type="checkbox"/> 55 - 59 years	<input type="checkbox"/> 35 - 39 years	<input type="checkbox"/> 60 - 64 years	<input type="checkbox"/> 40 - 44 years	<input type="checkbox"/> 65 years and over
<input type="checkbox"/> Under 25 years	<input type="checkbox"/> 45 - 49 years										
<input type="checkbox"/> 25 - 29 years	<input type="checkbox"/> 50 - 54 years										
<input type="checkbox"/> 30 - 34 years	<input type="checkbox"/> 55 - 59 years										
<input type="checkbox"/> 35 - 39 years	<input type="checkbox"/> 60 - 64 years										
<input type="checkbox"/> 40 - 44 years	<input type="checkbox"/> 65 years and over										
<p>3) Are you:</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Employed full-time</td> <td><input type="checkbox"/> Student</td> </tr> <tr> <td><input type="checkbox"/> Employed part-time</td> <td><input type="checkbox"/> Retired</td> </tr> <tr> <td><input type="checkbox"/> Registered unemployed</td> <td><input type="checkbox"/> Self Employed</td> </tr> <tr> <td><input type="checkbox"/> Un-waged, not registered unemployed (includes looking after home / family)</td> <td><input type="checkbox"/> Other</td> </tr> </table>		<input type="checkbox"/> Employed full-time	<input type="checkbox"/> Student	<input type="checkbox"/> Employed part-time	<input type="checkbox"/> Retired	<input type="checkbox"/> Registered unemployed	<input type="checkbox"/> Self Employed	<input type="checkbox"/> Un-waged, not registered unemployed (includes looking after home / family)	<input type="checkbox"/> Other		
<input type="checkbox"/> Employed full-time	<input type="checkbox"/> Student										
<input type="checkbox"/> Employed part-time	<input type="checkbox"/> Retired										
<input type="checkbox"/> Registered unemployed	<input type="checkbox"/> Self Employed										
<input type="checkbox"/> Un-waged, not registered unemployed (includes looking after home / family)	<input type="checkbox"/> Other										
<p>4) Which ethnic group do you consider yourself to be part of?</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> White</td> <td><input type="checkbox"/> Pakistan</td> </tr> <tr> <td><input type="checkbox"/> Indian</td> <td><input type="checkbox"/> Bangladesh</td> </tr> <tr> <td><input type="checkbox"/> Black - Caribbean</td> <td><input type="checkbox"/> Chinese</td> </tr> <tr> <td><input type="checkbox"/> Black - African</td> <td><input type="checkbox"/> Other</td> </tr> <tr> <td><input type="checkbox"/> Black (other) Please specify _____</td> <td>Please specify _____</td> </tr> </table> <p style="text-align: center; margin-top: 10px;">These categories are approved by the Commission for Racial Equality</p>		<input type="checkbox"/> White	<input type="checkbox"/> Pakistan	<input type="checkbox"/> Indian	<input type="checkbox"/> Bangladesh	<input type="checkbox"/> Black - Caribbean	<input type="checkbox"/> Chinese	<input type="checkbox"/> Black - African	<input type="checkbox"/> Other	<input type="checkbox"/> Black (other) Please specify _____	Please specify _____
<input type="checkbox"/> White	<input type="checkbox"/> Pakistan										
<input type="checkbox"/> Indian	<input type="checkbox"/> Bangladesh										
<input type="checkbox"/> Black - Caribbean	<input type="checkbox"/> Chinese										
<input type="checkbox"/> Black - African	<input type="checkbox"/> Other										
<input type="checkbox"/> Black (other) Please specify _____	Please specify _____										
<p>Thank you for providing details about South Yorkshire Police</p> <p>All information will be treated in the strictest confidence.</p> <div style="display: flex; align-items: center; justify-content: center; margin: 20px 0;">  </div> <p>The U.K. Customer Satisfaction Index Unit is a part of Sheffield Hallam University</p>											

Appendix 7 - 4th World Congress for Total Quality Management, 1999, Questionnaire



Dear TQM Congress Delegate,

*Integrating For Excellence
Achieving Customer Loyalty*

The goal of the World Congress of Total Quality Management is to provide our delegates with the ultimate in presentations and service. In order that we can build on the conference for next year we would like to create an index score of the success of this years conference. We would very much appreciate your co-operation in completing this questionnaire. Please complete and hand in this questionnaire to the organisers at the end of the conference. Alternatively, return the completed questionnaire to the following address as soon as possible:

Gopal Kanji, Sheffield Business School, Sheffield Hallam University, Pond Street, Sheffield, S1 1AY.

The majority of questions require you to tick one box per line.

1) Thinking of your overall experience with the Congress, all things considered, how would you describe your experience ON THIS OCCASION? Please tick a box from the scale below.										
1 Very disappointing	2	3	4	5	6	7	8	9	10 Outstanding	
↓	↓	↓	↓	↓	↓	↓	↓	↓		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) What were your expectations before the conference of the items below:										
	1 Low Expectations	2	3	4	5	6	7	8	9	10 High Expectations
	↓	↓	↓	↓	↓	↓	↓	↓	↓	
Range of Topics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conference Venue Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Catering Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relevance of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) In relation to the services that you receive from Congress, to what extent have they fallen short of, or, exceeded your expectations?										
1 Falls short of expectations	2	3	4	5	6	7	8	9	10 Exceeds expectations	
↓	↓	↓	↓	↓	↓	↓	↓	↓		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) How satisfied were you with each of the below?										
	1 Very Dissatisfied	2	3	4	5	6	7	8	9	10 Very Satisfied
Overall Staff Courtesy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The locations of the syndicate rooms ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conference Venue Facilities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How well did it match your needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relevance of Speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) How do you value the cost of the conference in relation to:										
	1 Very Dissatisfied	2	3	4	5	6	7	8	9	10 Very Satisfied
The service received	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Assortment of speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of speakers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) How would you rate the image of the Congress in terms of being:										
	1 Very low image	2	3	4	5	6	7	8	9	10 Very high image
Professional.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Friendly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Academic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to Business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8) How likely is it that you will attend the 5th World Congress of Total Quality Management in 2000?										
	1 Very unlikely	2	3	4	5	6	7	8	9	10 Very likely
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9)	During the Congress, do you feel that you have had cause for complaint?																																								
<input type="checkbox"/> Yes	Please continue with question 10)																																								
<input type="checkbox"/> No	Please go to Q13																																								
10)	Broadly, what were these issues about?																																								
<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px;"></div>																																									
11)	Did you report the problem to the Congress organisers?																																								
<input type="checkbox"/> Yes	Please continue with question 12)																																								
<input type="checkbox"/> No	Please go to Q13																																								
12)	How would you rate the way in which the complaint was handled?																																								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 10%;">1</td> <td style="text-align: center; width: 10%;">2</td> <td style="text-align: center; width: 10%;">3</td> <td style="text-align: center; width: 10%;">4</td> <td style="text-align: center; width: 10%;">5</td> <td style="text-align: center; width: 10%;">6</td> <td style="text-align: center; width: 10%;">7</td> <td style="text-align: center; width: 10%;">8</td> <td style="text-align: center; width: 10%;">9</td> <td style="text-align: center; width: 10%;">10</td> </tr> <tr> <td style="text-align: center;">Very poorly</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Very well</td> </tr> <tr> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		1	2	3	4	5	6	7	8	9	10	Very poorly									Very well	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8	9	10																																
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↓	↓	↓	↓	↓	↓	↓	↓	↓	↓																																
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																
13)	How likely is it that you would recommend this conference to personal friends or associates?																																								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 10%;">1</td> <td style="text-align: center; width: 10%;">2</td> <td style="text-align: center; width: 10%;">3</td> <td style="text-align: center; width: 10%;">4</td> <td style="text-align: center; width: 10%;">5</td> <td style="text-align: center; width: 10%;">6</td> <td style="text-align: center; width: 10%;">7</td> <td style="text-align: center; width: 10%;">8</td> <td style="text-align: center; width: 10%;">9</td> <td style="text-align: center; width: 10%;">10</td> </tr> <tr> <td style="text-align: center;">Very unlikely</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Very likely</td> </tr> <tr> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		1	2	3	4	5	6	7	8	9	10	Very unlikely									Very likely	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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13)	If you had to choose one TQM conference to attend, how likely it that you choose the World Congress at Sheffield?																																								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 10%;">1</td> <td style="text-align: center; width: 10%;">2</td> <td style="text-align: center; width: 10%;">3</td> <td style="text-align: center; width: 10%;">4</td> <td style="text-align: center; width: 10%;">5</td> <td style="text-align: center; width: 10%;">6</td> <td style="text-align: center; width: 10%;">7</td> <td style="text-align: center; width: 10%;">8</td> <td style="text-align: center; width: 10%;">9</td> <td style="text-align: center; width: 10%;">10</td> </tr> <tr> <td style="text-align: center;">Very unlikely</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Very likely</td> </tr> <tr> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		1	2	3	4	5	6	7	8	9	10	Very unlikely									Very likely	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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15)	If you can imagine an ideal conference, how well do you think the Congress compares with this?																																								
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 10%;">1</td> <td style="text-align: center; width: 10%;">2</td> <td style="text-align: center; width: 10%;">3</td> <td style="text-align: center; width: 10%;">4</td> <td style="text-align: center; width: 10%;">5</td> <td style="text-align: center; width: 10%;">6</td> <td style="text-align: center; width: 10%;">7</td> <td style="text-align: center; width: 10%;">8</td> <td style="text-align: center; width: 10%;">9</td> <td style="text-align: center; width: 10%;">10</td> </tr> <tr> <td style="text-align: center;">Unfavourably</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td style="text-align: center;">Favourably</td> </tr> <tr> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> <td style="text-align: center;">↓</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		1	2	3	4	5	6	7	8	9	10	Unfavourably									Favourably	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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16) Are there any other areas or issues connected with the Congress that you would like to make further comments about?

Personal Details

1) Are you male or female?

- ☐ Male
- ☐ Female

2) What age group are you in?

- | | |
|---|--|
| <input type="checkbox"/> Under 25 years | <input type="checkbox"/> 45 - 49 years |
| <input type="checkbox"/> 25 - 29 years | <input type="checkbox"/> 50 - 54 years |
| <input type="checkbox"/> 30 - 34 years | <input type="checkbox"/> 55 - 59 years |
| <input type="checkbox"/> 35 - 39 years | <input type="checkbox"/> 60 - 64 years |
| <input type="checkbox"/> 40 - 44 years | <input type="checkbox"/> 65 years and over |

3) Which of the categories below best describes your current employment status?

- ☐ Academic
- ☐ Public Sector
- ☐ Business \ Industry
- ☐ Other
Please specify _____

Thank you for providing details about the Fourth World Congress for Total Quality Management

All information will be treated in the strictest confidence.

Appendix 8 - Covering Letter (SYP, 1997)

Below can be seen the covering letter that was sent with the 1998, South Yorkshire Police questionnaire. The other postal surveys used a letter that was very similar.



Customer Satisfaction Index Unit
 Management Sciences Research Centre
 School of Computing & Management Science
 Pond Street, Sheffield, S1 1WB
 Tel. 0114 225 4230,
 Fax. 0114 225 3161

30 November, 1998

Dear Sir \ Madam

Re. Contact with South Yorkshire Police

As part of South Yorkshire Police's commitment to continuously improve its services, your help would be greatly appreciated. At the present time Sheffield Hallam University has been employed to measure the current rate of satisfaction with which the general public holds the police.

As part of this measurement process, the questionnaire that you will find enclosed has been developed. If you could find the time to complete and then return the questionnaire in the envelope provided, you will make the task of the university that much easier.

The aim of the questionnaire is to find out how the people of South Yorkshire judge themselves to have been treated following a non-domestic burglary, i.e. a break in at a commercial premises, or, of an out building.

This work is being carried out in conjunction with the Research and Development Department of South Yorkshire Police.

If you have queries please do not hesitate to contact me:

Jonathan Gorst
 Customer Satisfaction Index Unit
 Sheffield Hallam University, Pond Street
 Sheffield, S1 1AY
 Tel: 0114 225 3101
 Fax: 0114 225 3161
 E-mail: J.Gorst@shu.ac.uk

Thank you in advance for your assistance.

Yours faithfully

J.K. Gorst
 Researcher
 Customer Satisfaction Index Unit

Appendix 9 - Explanation Sheet

Below is the explanation sheet as used for the south Yorkshire Police, 1998 study.



How to complete the questionnaire

The purpose of this questionnaire is to collect data for South Yorkshire Police. South Yorkshire Police is interested to know how satisfied the general public is with the level of service it provides, so that areas in which it is under-performing can be improved.

The questionnaire is straight forward to complete:

- Most of the questions require you to tick a number in order that you can indicate how much you like or dislike an idea. For example:

1) Thinking of your overall experience with SYP, all things considered, how would you describe your experience? Please tick a box from the scale below which best describes how you feel.

1	2	3	4	5	6	7	8	9	10
Very disappointing									Outstanding
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The question is asking you to give a score between 1 and 10 on how well you think the police satisfy your needs.

For each question of this type, please tick one number only.

- Where a question requests comments, please feel free to write as much or as little as you wish.
- The other type of question are straight yes / no questions. Please tick the box at the side of your preference.

When you have completed the questionnaire, please return it in the pre-paid envelope provided.

Thank you for your time.

Appendix 10 - Figures and Tables Pertaining to Chapter 4

This appendix contains diagrams, graph and tables that pertain to Chapter 4 - Model Development, Validation, Data Analysis

Figure 1 - Placing Observed Variables

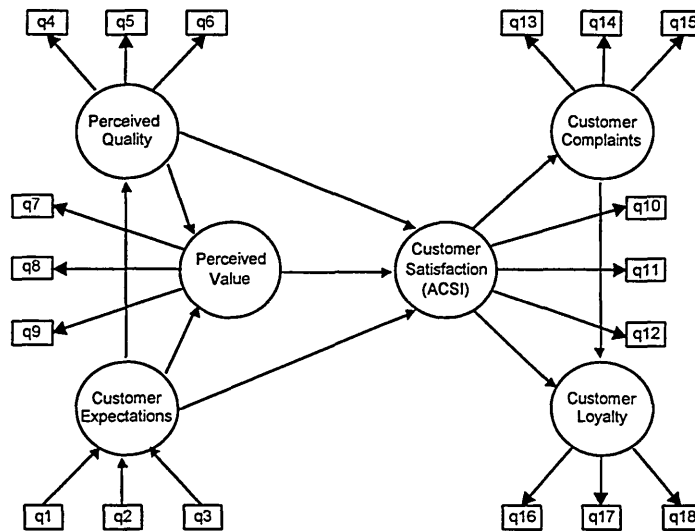


Figure 2 - Mapping the SYP (1997) data to the ACSI model

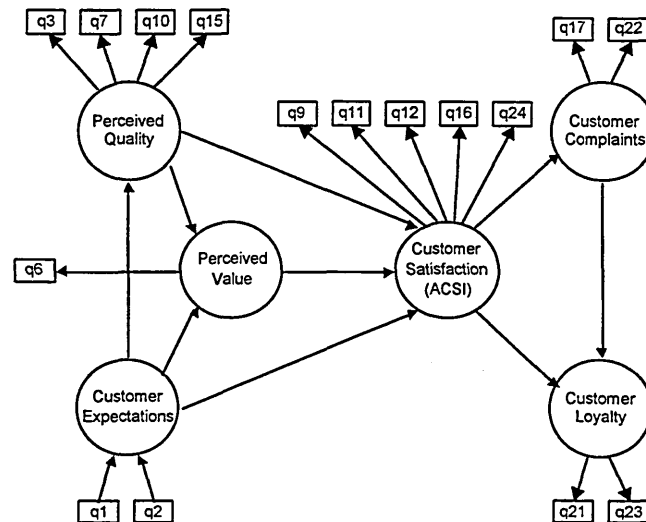


Table 1 - PLS output, weighting for each question (SYP, 1997)

	Col 1 (Exp)	Col 2 (Qual)	Col 3 (Val)	Col 4 (C. S.)	Col 5 (Comp)	Col 6 (Loy)
Row 1 (q1)	0.3183107	0	0	0	0	0
Row 2 (q2)	0.8813928	0	0	0	0	0
Row 3 (q3)	0	0.2723636	0	0	0	0
Row 4 (q7)	0	0.1548405	0	0	0	0
Row 5 (q10)	0	0.5619775	0	0	0	0
Row 6 (q15)	0	0.2673672	0	0	0	0
Row 7 (q6)	0	0	1	0	0	0
Row 8 (q9)	0	0	0	0.1099051	0	0
Row 9 (q11)	0	0	0	0.2387656	0	0
Row 10 (q12)	0	0	0	0.0164703	0	0
Row 11 (q16)	0	0	0	0.5723504	0	0
Row 12 (q24)	0	0	0	0.2577143	0	0
Row 13 (q17)	0	0	0	0	0.4305835	0
Row 14 (q22)	0	0	0	0	0.711776	0
Row 15 (q21)	0	0	0	0		1

(The question numbers refer to the questionnaire).

Figure 3 - Mapping the YPO data to the ACSI model

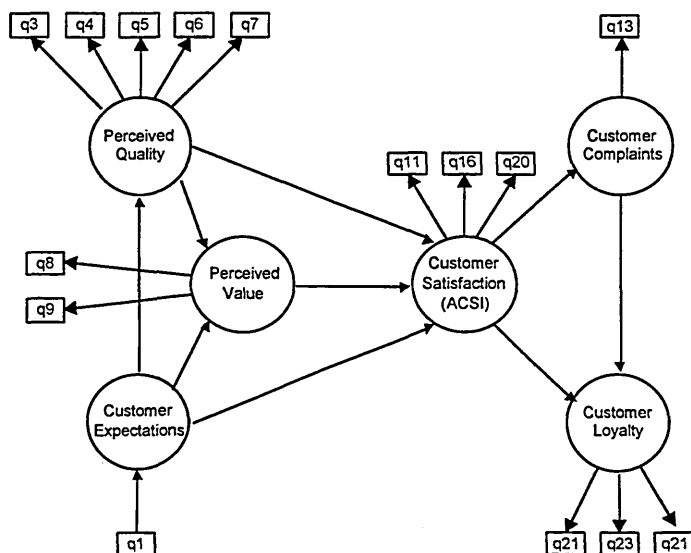
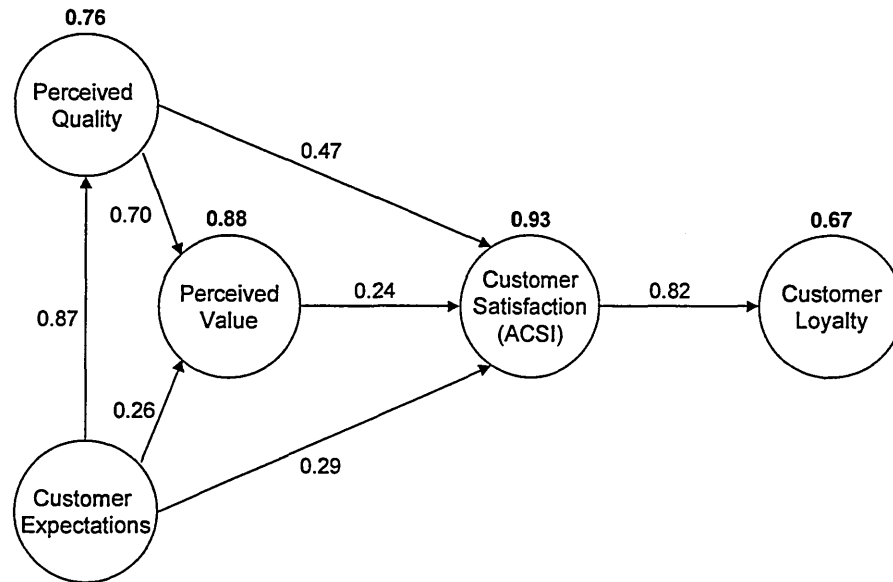


Figure 4 - The Sheffield Model, YPO data (full data set)



All path coefficients are significant at the 5% T-Test level.

Figure 5 - Mapping the World Congress (1998) data to the ACSI model

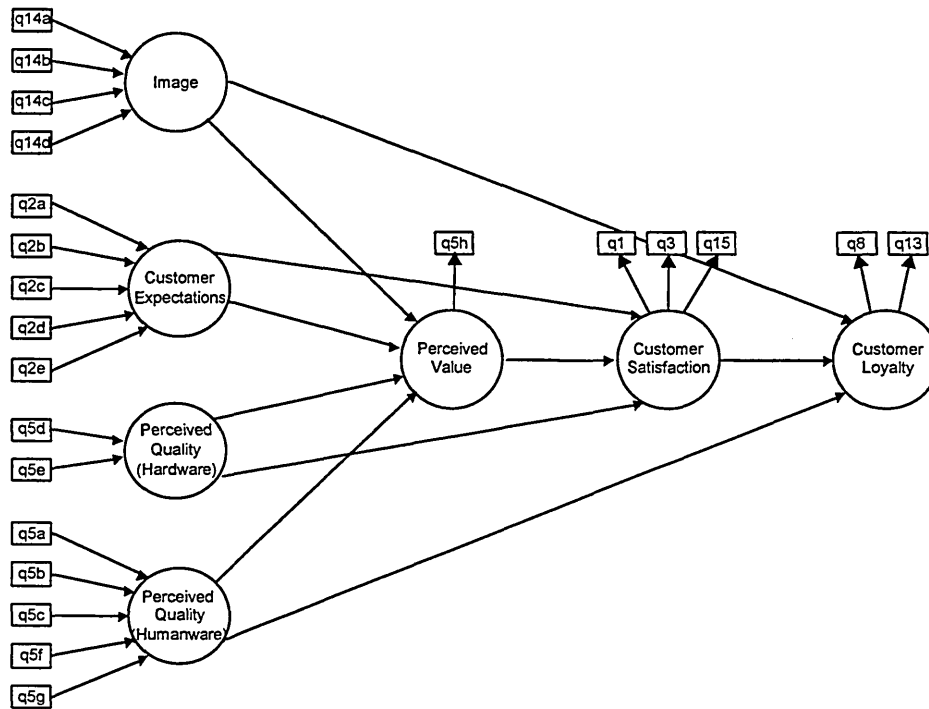
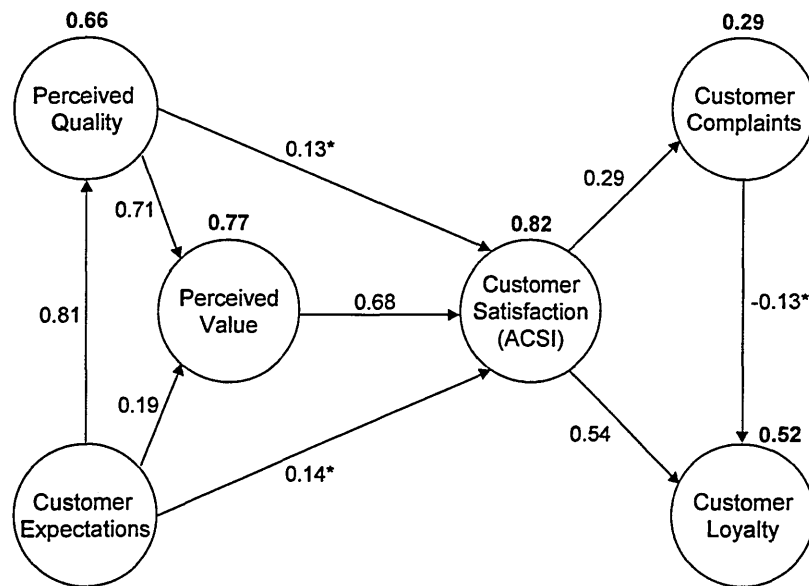


Table 2 - Alpha Values - World Congress (1998) Data

Latent Variable*	Manifest Variable	Alpha if Manifest Removed	Overall Alpha
Expectations	Q2a	0.8580	0.8945
	Q2b	0.8644	
	Q2c	0.8865	
	Q2d	0.8710	
	Q2e	0.8779	
Quality (As one latent variable)	Q5a	0.9374	0.9481
	Q5b	0.9373	
	Q5c	0.9356	
	Q5d	0.9436	
	Q5e	0.9520	
	Q5f	0.9382	
	Q5g	0.9339	
Soft Quality	Q5f	-	0.9329
	Q5g	-	
Hard Quality	Q5a	0.8876	0.9217
	Q5b	0.8882	
	Q5c	0.8863	
	Q5d	0.9193	
	Q5e	0.9337	
Image	Q14a	0.7669	0.8644
	Q14b	0.7842	
	Q14c	0.9119	
	Q14d	0.8263	
Customer Satisfaction	Q1	0.9011	0.9317
	Q3	0.9025	
	Q15	0.8991	

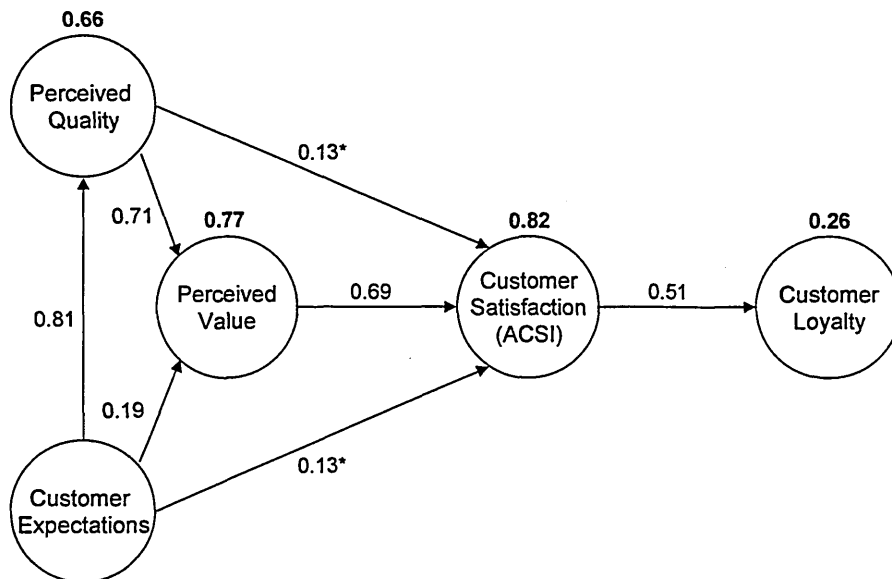
* The latent variables of value and complaints do not have an alpha score because they are only fed by one manifest variable. The alpha score for loyalty is not included because it is fed by yes \ no type manifest variables

Figure 6 - ACSI model, World Congress Data (1998)



* indicates the paths that are not significant at the 5% t-test level.

Figure 7 - Sheffield model, World Congress data



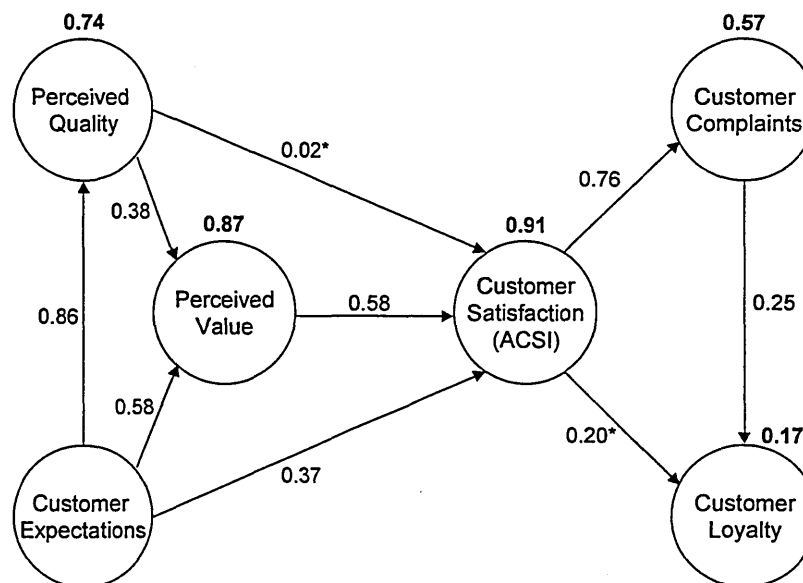
* indicates the paths that are not significant at the 5% t-test level.

Table 3 - Alpha Values - SYP (1998) Part 12 Data

Latent Variable	Manifest Variable	Alpha if Manifest Removed	Overall Alpha
Expectations	Q2a	0.8959	0.8071
	Q2b	0.6144	
	Q2c	0.6409	
Quality	Q5a	0.9146	0.8338
	Q5b	0.5995	
	Q5c	0.6858	
Image	Q13a	0.8546	0.8954
	Q14b	0.8386	
	Q13c	0.8567	
Customer Satisfaction	Q1	0.7891	0.9232
	Q3	0.8777	
	Q14	0.9098	

* The latent variables of value, complaints and loyalty do not have an alpha score because they are only fed by one manifest variable.

Figure 8 - ACSI model, SYP 1998 data



* indicates the paths that are not significant at the 5% t-value level.

Figure 9 - Sheffield Model, SYP 1998 data

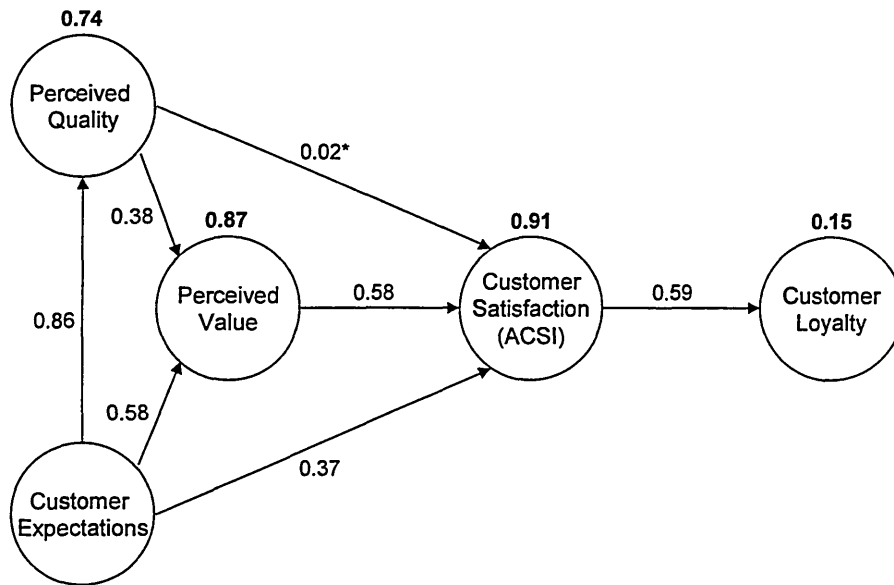
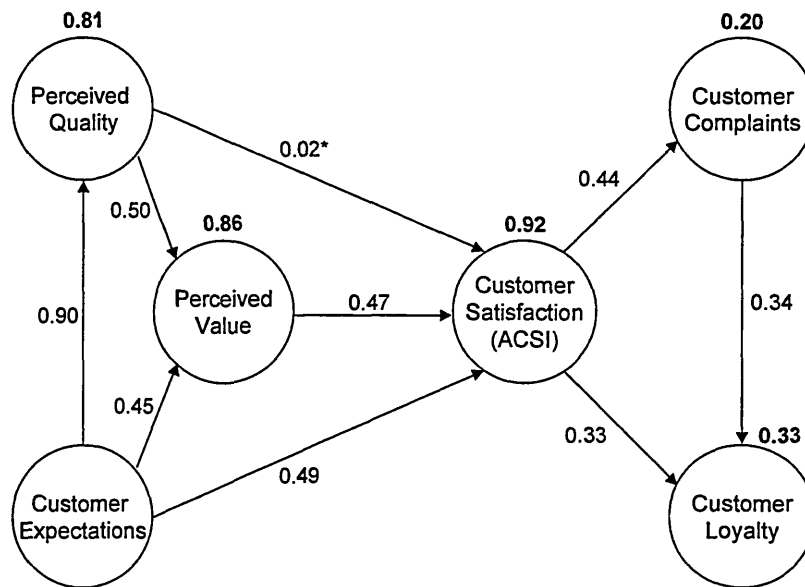


Table 4 - Alpha Values - SYP (1998) Part 3 Data

Latent Variable	Manifest Variable	Alpha if Manifest Removed	Overall Alpha
Expectations	Q2a	0.8945	0.8446
	Q2b	0.7264	
	Q2c	0.7044	
Quality	Q5a	0.9332	0.9007
	Q5b	0.8310	
	Q5c	0.7849	
Image	Q13a	0.8698	0.9049
	Q13b	0.8826	
	Q13c	0.8386	
Customer Satisfaction	Q1	0.8857	0.9318
	Q3	0.9124	
	Q14	0.9042	

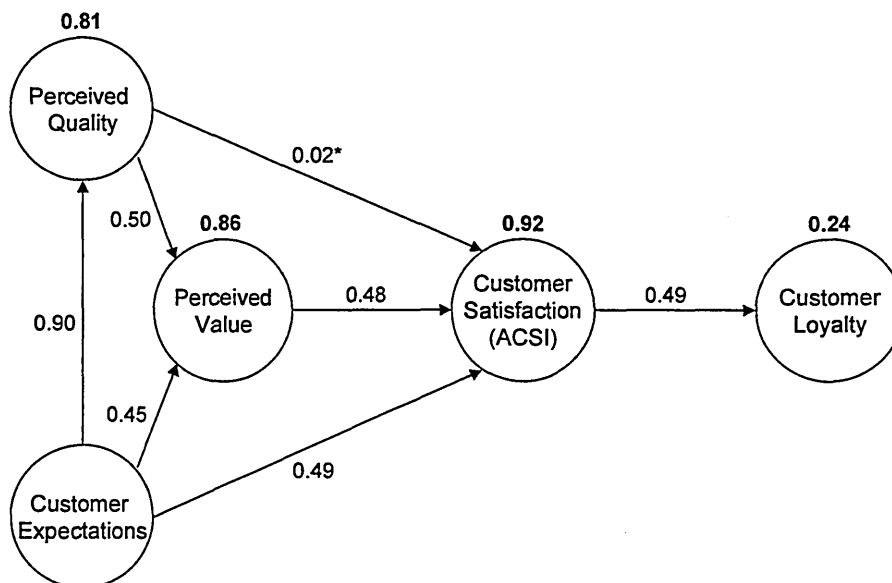
* The latent variables of value, complaints and loyalty do not have an alpha score because they are only fed by one manifest variable.

Figure 10 - The ACSI Model, SYP (1998) Data, Part 3



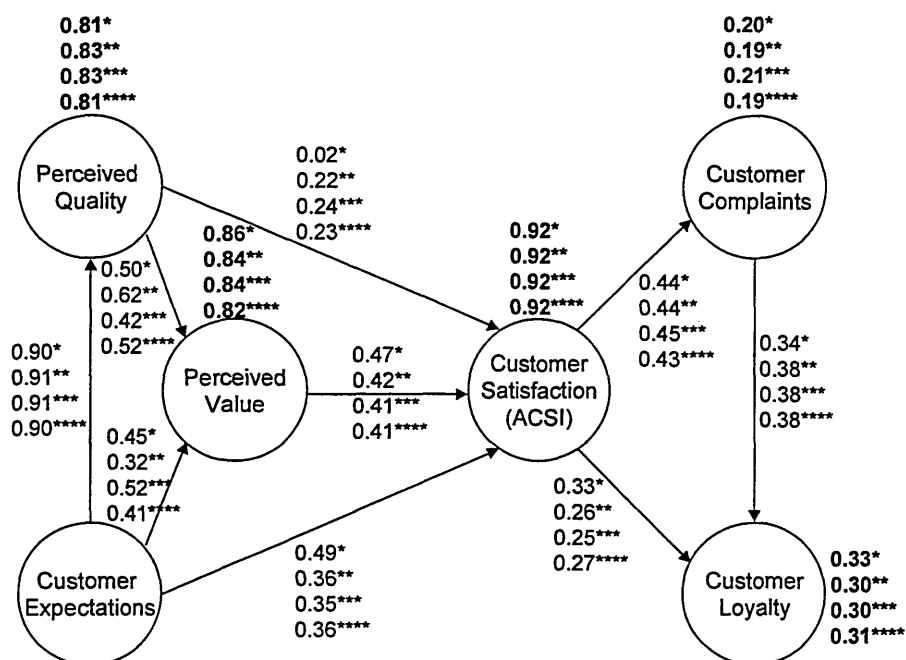
* indicates paths that are not significant at the 5% t-value level.

Figure 11 - Sheffield Model, SYP (1998) Data, Part 3



* indicates paths that are not significant at the 5% t-value level.

Figure 12 - Removal of Manifest Variables



Key

- * Original Data
- ** Minus Q2a
- *** Minus Q5a
- **** Minus Q2a and Q5a

Table 5 - The Effect on the Index Scores

Latent Variable	ACSI (Original)	ACSI No Q2a	ACSI No Q5a	ACSI No Q2a, Q5a
Expectations	57.87	56.47	57.71	56.47
Quality	69.33	65.83	64.93	64.52
Value*	52.84	52.84	52.84	50.84
Customer Satisfaction	54.10	54.47	53.90	54.91
Complaints*	84.33	84.33	84.33	84.33
Loyalty*	51.55	51.55	51.55	51.55

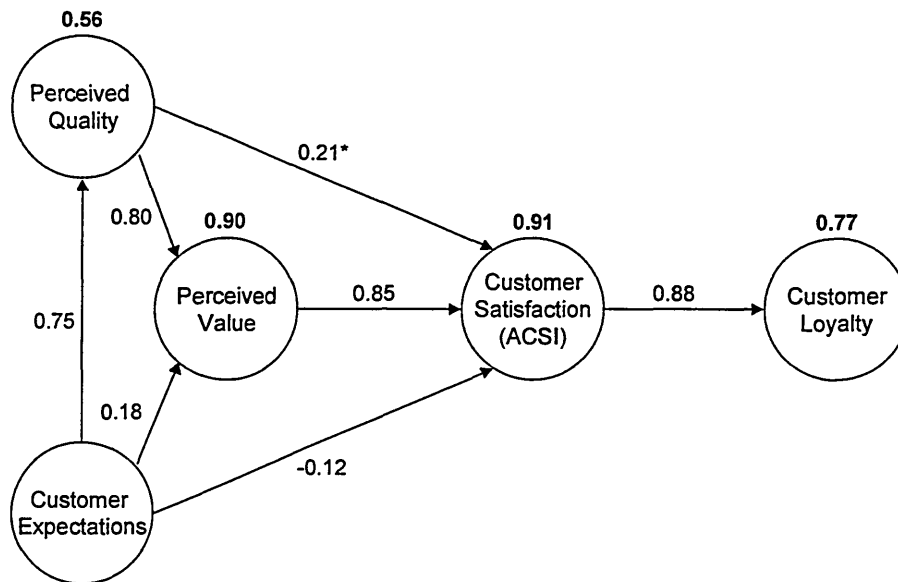
* The index scores for these latent variables do not change because there is only one manifest variable feeding the latent variable.

Table 6 - Alpha Values - World Congress (1999)

Latent Variable*	Manifest Variable	Alpha if Manifest Removed	Overall Alpha
Expectations	Q2a	0.5383	0.6572
	Q2b	0.5826	
	Q2c	0.6899	
	Q2d	0.5857	
	Q2e	0.6164	
Quality (As one latent variable)	Q5a	0.8545	0.8719
	Q5b	0.8470	
	Q5c	0.8629	
	Q5d	0.8345	
	Q5e	0.8213	
Soft Quality	Q5e	-	0.8308
	Q5f	-	
Hard Quality	Q5a	0.7199	0.7514
	Q5b	0.6253	
	Q5c	0.6465	
Image	Q7a	0.6033	0.7419
	Q7b	0.7018	
	Q7c	0.7370	
	Q7d	0.6806	
Value	Q6a	0.9217	0.8059
	Q6b	0.5547	
	Q6c	0.6611	
Customer Satisfaction	Q1	0.7848	0.8694
	Q3	0.8673	
	Q15	0.7961	
Loyalty	Q8	0.7641	0.7945
	Q13	0.6889	
	Q14	0.7091	

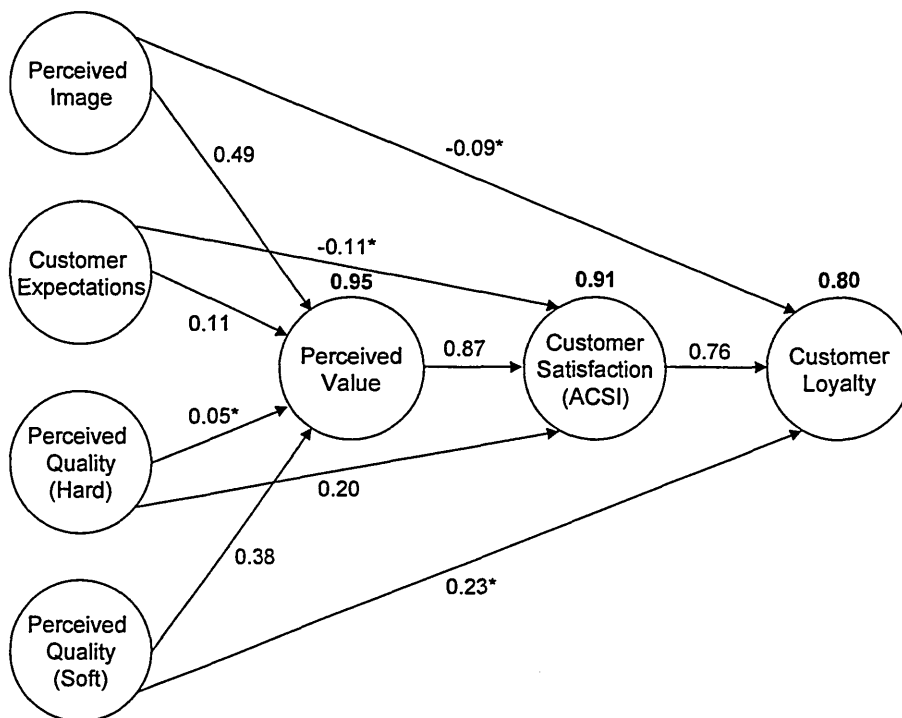
* The latent variable of complaints does not have an alpha score because they are only fed by one manifest variable.

Figure 13 Sheffield Model, World Congress (1999) data



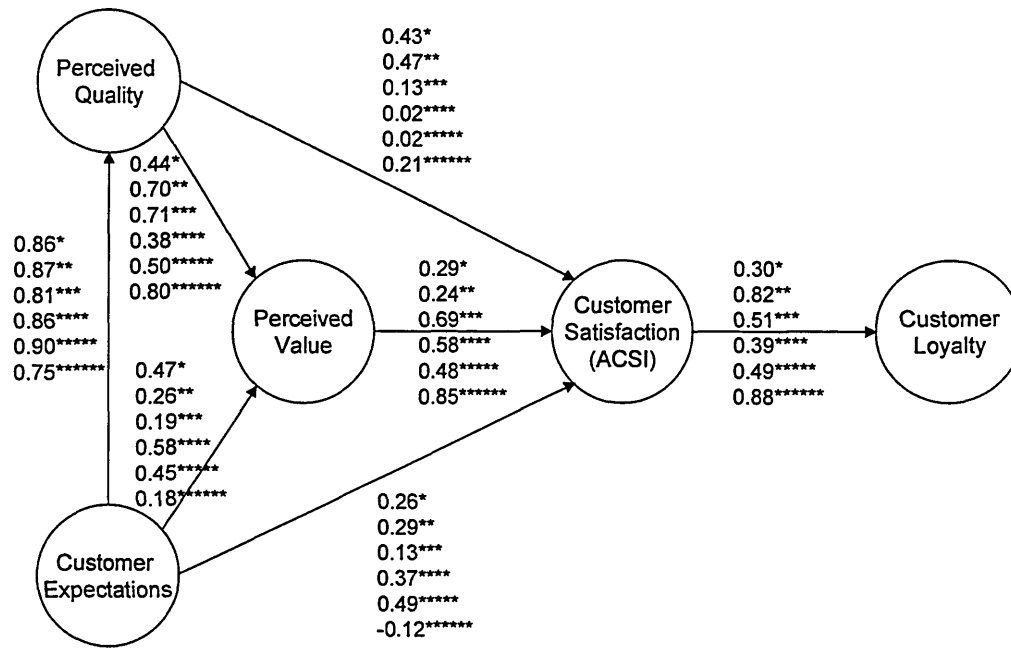
* indicates the paths that are not significant at the 5% t-value level.

Figure 14 - ECSI Model, World Congress (1999) data



* indicates the paths that are not significant at the 5% t-value level.

Figure 15 - Data Comparisons, Sheffield Model



Key

- | | | | |
|-----|-----------------------|-------|-----------------------|
| * | SYP (1997) | **** | SYP (1998) Part 12 |
| ** | YPO | ***** | SYP (1998) Part 3 |
| *** | World congress (1998) | ***** | World Congress (1999) |

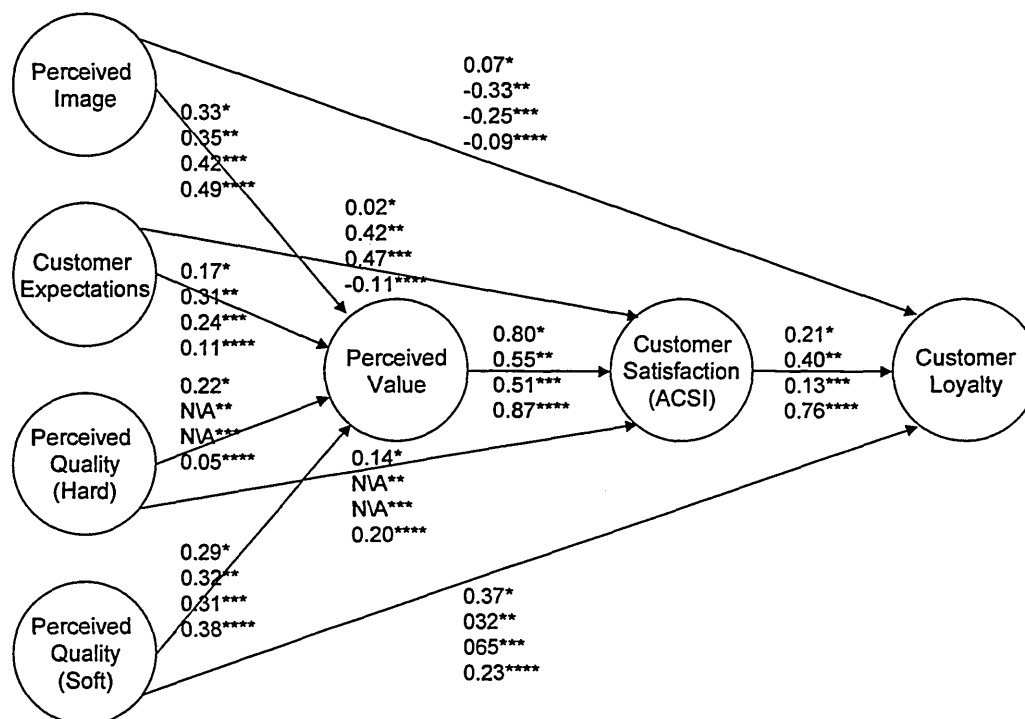
Table 7 - R² Values, Sheffield Model

Latent Variable	Data Set					
	SYP (1997)	YPO	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Quality	0.75	0.76	0.66	0.74	0.81	0.75
Value	0.78	0.88	0.77	0.87	0.86	0.95
Customer Satisfaction	0.87	0.93	0.82	0.91	0.92	0.96
Loyalty	0.09	0.67	0.26	0.15	0.24	0.88

Table 8 - Comparison of Index Scores using the Sheffield Model

Latent Variable	Data Set					
	SYP (1997)	YPO	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Expectations	58.13	75.97	69.65	65.43	58.87	69.71
Quality	74.03	81.67	72.34	72.93	69.33	64.78
Value	55.13	75.50	69.14	55.11	52.84	62.26
Customer Satisfaction	65.30	74.92	62.79	58.78	54.07	56.25
Loyalty	46.88	74.69	59.122	71.44	51.55	57.39

Figure 16 - The ECSI Model, World Congress data, SYP (1998) data



Key

- | | | | |
|----|-----------------------|------|-----------------------|
| * | World congress (1998) | *** | SYP (1998) Part 3 |
| ** | SYP (1998) Part 12 | **** | World Congress (1999) |

Table 9 - R² Values

Latent Variable	Data Set			
	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Value	0.89	0.90	0.89	0.95
Customer Satisfaction	0.88	0.91	0.91	0.91
Loyalty	0.40	0.17	0.29	0.80

Table 10 - Comparison of Index Scores using the ECSI Model

Latent Variable	Data Set			
	World Congress (1998)	SYP (1998) Part 12	SYP (1998) Part 3	World Congress (1999)
Expectations	69.35	65.20	58.18	69.43
Soft Quality	64.35	69.14	67.76	59.09
Hard Quality	77.71	N/A	N/A	76.77
Image	68.81	72.96	63.21	64.23
Value	69.14	55.11	52.84	63.25
Customer Satisfaction	63.52	58.71	53.29	56.13
Loyalty	59.12	71.44	51.55	57.55

Appendix 11 - Tables and Figures from Chapter 5

Table 1 - Percentage response by age group

Age Group	Car Crime %	Burglary %	Total %
Under 18	0	1.15	0.61
18 - 25	16.88	17.24	17.07
26 - 35	25.97	22.99	24.39
36 - 45	22.08	17.24	19.51
46 - 55	20.78	24.13	22.56
56 - 65	3.90	3.45	3.66
66 - 75	6.49	2.30	4.27
Over 75	3.90	11.49	7.93
Total	100.00	100.00	100.00

No non-response.

Figure 1 - Mapping the questions to the model

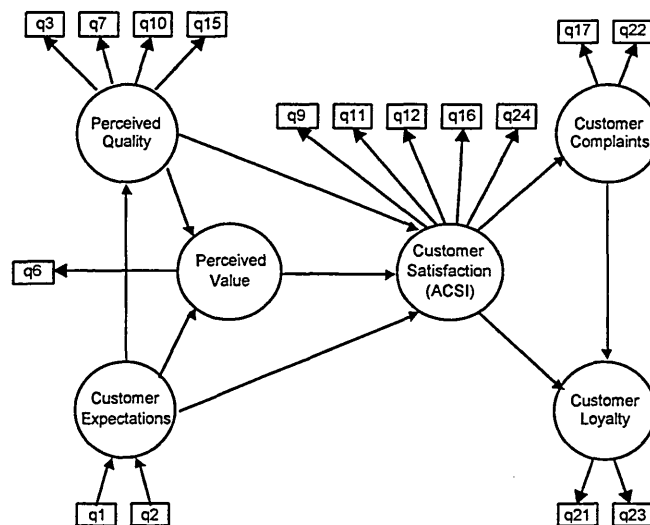


Figure 2 - Path Co-efficient, Burglary vs Car Crime

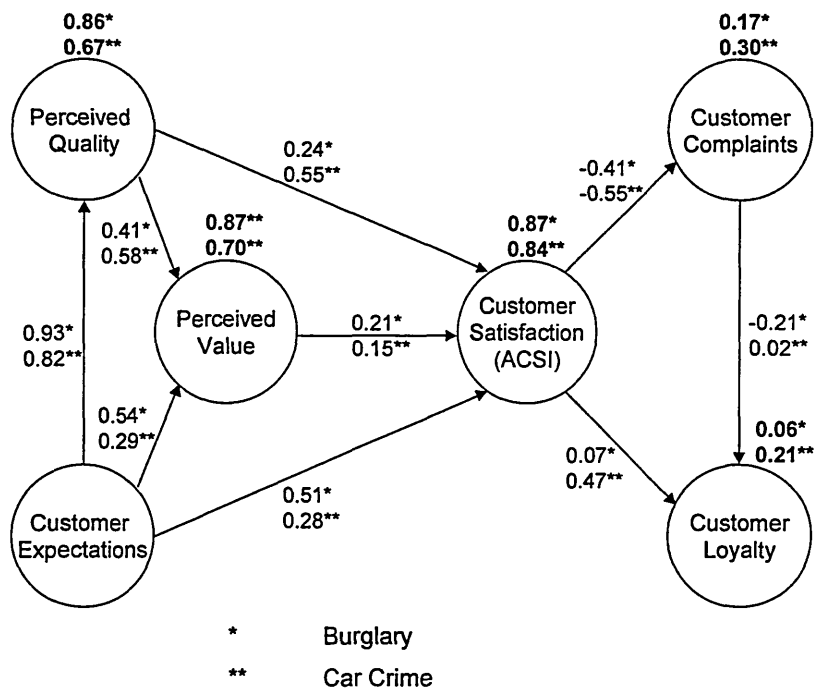


Figure 3 - Path Co-efficient, Districts H and J

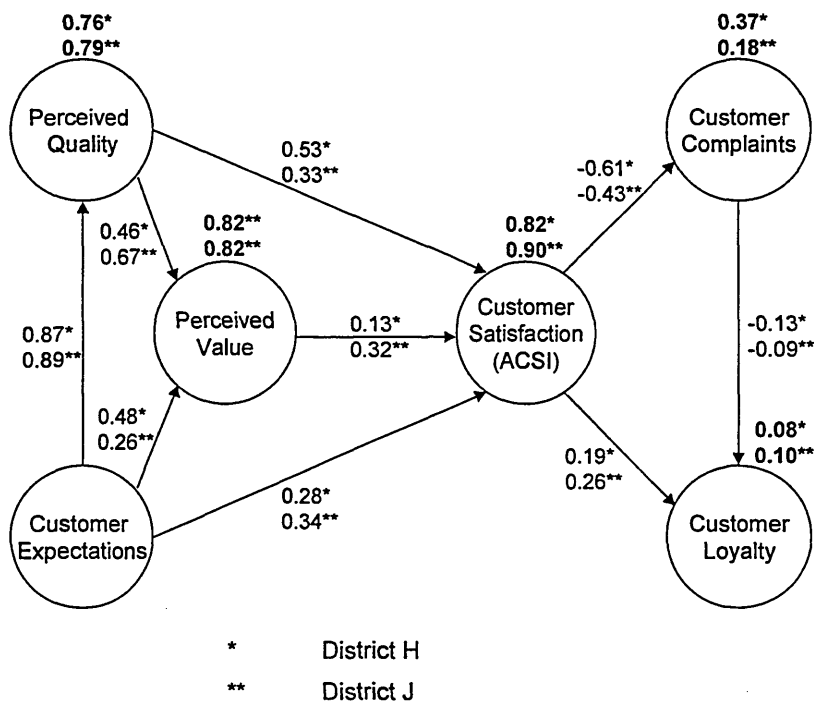
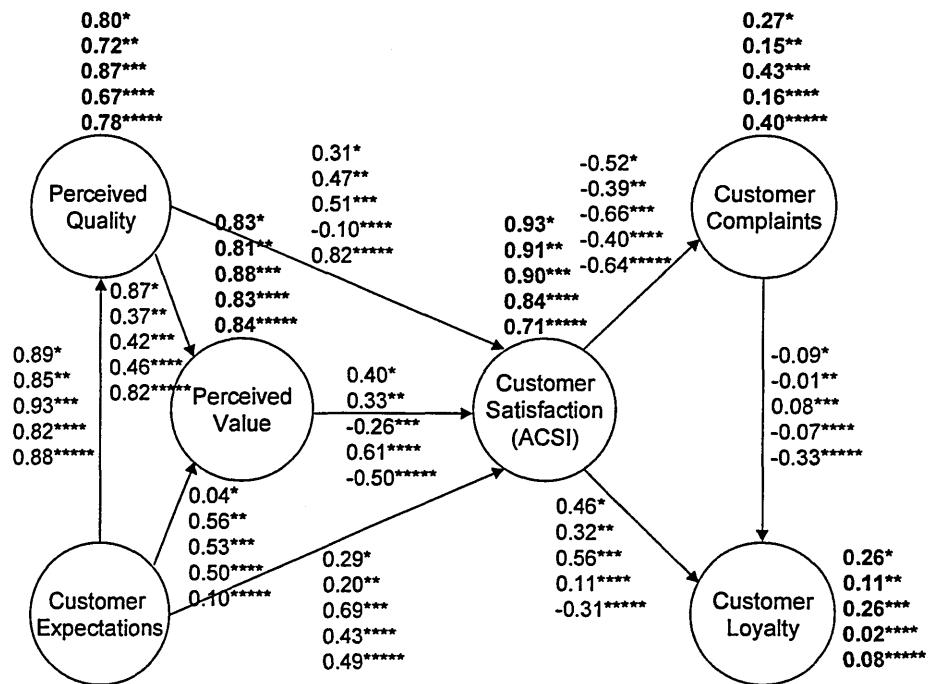


Figure 4 - Path Co-efficient, By Age



* Under 26 years
 ** 26 - 35 years
 *** 36 - 45 years
 **** 46 - 55 years
 ***** Over 55 years

Figure 5 - Path Co-efficient, By Occupation

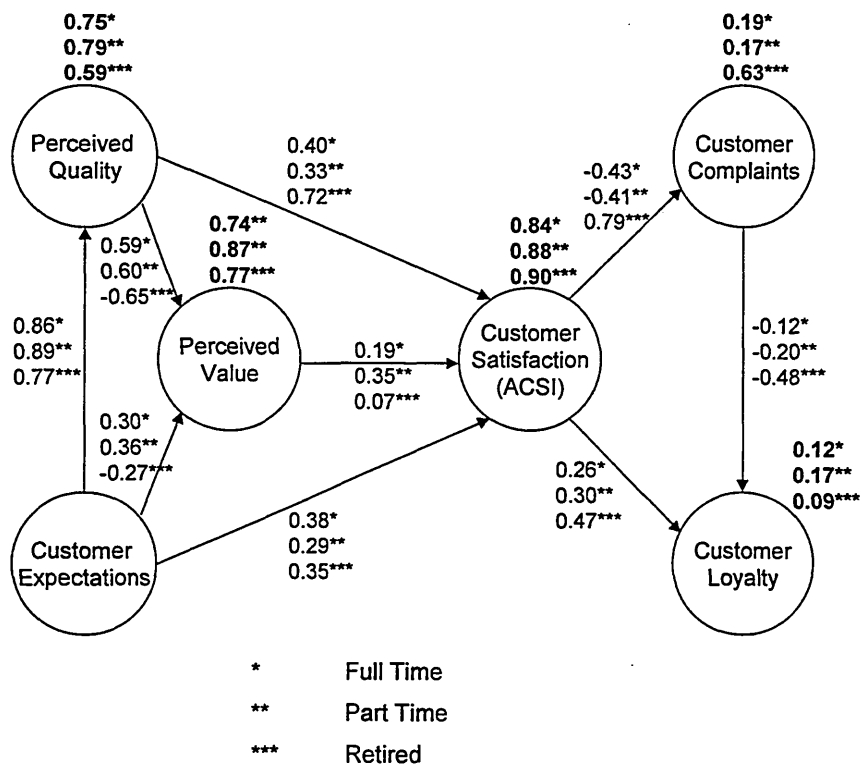


Table 2 - Percentage response by gender

Gender	Overall (%)	Part 1 (%)	Part 2 (%)	Part 3 (%)
Male	64.5	68.4	55.7	67.0
Female	33.6	30.8	40.9	30.9
Non-Response	1.9	0.8	3.4	2.1

Table 3 - Percentage Response by age

Age Group	Overall (%)	Part 1 (%)	Part 2 (%)	Part 3 (%)
Under 25 years	3.1	2.3	3.4	4.1
25 - 29 years	8.2	6.0	6.8	12.4
30 - 34 years	11.0	7.5	8.0	18.6
35 - 39 years	16.7	15.0	8.0	26.8
40 - 44 years	15.7	15.0	12.5	19.6
45 - 49 years	17.3	18.8	15.9	16.5
50 - 54 years	11.6	16.5	17.0	2.1
55 - 59 years	7.2	9.8	11.4	0
60 - 64 years	4.4	6.8	5.7	0
Over 65 years	3.1	2.3	8.0	0
Non-Response	1.6	0	3.4	2.1

Table 4 - Percentage response by employment status

Occupation	Overall (%)	Part 1 (%)	Part 2 (%)	Part 3 (%)
Employed full-time	59.1	66.9	48.9	57.7
Employed part-time	9.4	9.8	3.4	14.4
Registered Unemployed	0.9	0	0	3.1
Un-waged	1.9	0	3.4	3.1
Student	0.9	0	1.1	2.1
Retired	3.5	1.5	9.7	1.0
Self Employed	21.4	21.1	29.5	14.4
Other	1.3	0.8	1.1	2.1
Non-Response	1.6	0	3.4	2.1

Table 5 - Part 1

Question	Factor 1	Factor 2	Factor 3	Dimension
Q1	0.81049	0.31431	0.25341	CS
Q2a	0.45448	0.18149	0.31878	Exp
Q2b	0.81192	0.22585	0.26198	Exp
Q2c	0.88073	0.21645	0.23954	Exp
Q3	0.84450	0.35017	0.15239	CS
Q4	0.68813	0.42355	-0.11585	Val
Q5a	0.15251	0.24683	0.88203	Qual
Q5b	0.63478	0.23194	0.61709	Qual
Q5c	0.75233	0.22940	0.42205	Qual
Q13a	0.28311	0.87048	0.14799	Img
Q13b	0.53073	0.62709	0.32789	Img
Q13c	0.27070	0.74101	0.43636	Img
Q14	0.69728	0.47782	0.28552	CS

Varimax converged in 8 iterations.

Table 6 - Part 2

Question	Factor 1	Factor 2	Factor 3	Dimension
Q1	0.84275	0.24188	0.31260	CS
Q2a	0.64523	0.35475	-0.13325	Exp
Q2b	0.78490	0.22151	0.25249	Exp
Q2c	0.76842	0.38243	0.32142	Exp
Q3	0.83003	0.21984	0.32192	CS
Q4	0.63034	0.14342	0.14427	Val
Q5a	0.07361	0.38467	0.79799	Qual
Q5b	0.47630	0.23787	0.77248	Qual
Q5c	0.86576	0.18191	0.65823	Qual
Q13a	0.25702	0.85913	0.31420	Img
Q13b	0.45069	0.78511	0.25432	Img
Q13c	0.26748	0.88418	0.23364	Img
Q14	0.71898	0.45444	0.25405	CS

Varimax converged in 8 iterations.

Table 7 - Part 3

Question	Factor 1	Factor 2	Factor 3	Dimension
Q1	0.81401	0.21013	0.33442	CS
Q2a	0.24789	0.30824	0.79201	Exp
Q2b	0.55838	0.37472	0.55501	Exp
Q2c	0.75590	0.25157	0.47680	Exp
Q3	0.84453	0.24753	0.25491	CS
Q4	0.68120	0.35840	0.34110	Val
Q5a	0.38852	0.70875	0.18834	Qual
Q5b	0.77722	0.42291	0.12579	Qual
Q5c	0.84717	0.27576	0.24975	Qual
Q13a	0.15921	0.87198	0.20636	Img
Q13b	0.43402	0.73148	0.16768	Img
Q13c	0.25702	0.86658	0.16391	Img
Q14	0.81781	0.31701	0.21013	CS

Varimax converged in 7 iterations.

Table 8 - Parts 1 & 2

Question	Factor 1	Factor 2	Factor 3	Dimension
Q1	0.82607	0.27580	0.28711	CS
Q2a	0.54759	0.39004	-0.06815	Exp
Q2b	0.78775	0.22641	0.27966	Exp
Q2c	0.81557	0.27799	0.32810	Exp
Q3	0.84158	0.26155	0.26471	CS
Q4	0.68279	0.23288	0.05739	Val
Q5a	0.07773	0.35036	0.83101	Qual
Q5b	0.53709	0.22779	0.72943	Qual
Q5c	0.68939	0.179992	0.59728	Qual
Q13a	0.28302	0.83718	0.24392	Img
Q13b	0.49293	0.70992	0.29835	Img
Q13c	0.26561	0.82883	0.31535	Img
Q14	0.70260	0.45942	0.28690	CS

Varimax converged in 8 iterations.

Table 8 - Parts 1, 2 & 3

Question	Factor 1	Factor 2	Factor 3	Dimension
Q1	0.80371	0.26138	0.34351	CS
Q2a	0.22981	0.21011	0.87671	Exp
Q2b	0.67378	0.27024	0.46562	Exp
Q2c	0.78882	0.30143	0.36986	Exp
Q3	0.83084	0.24867	0.30936	CS
Q4	0.68738	0.21217	0.00153	Val
Q5a	0.33009	0.72772	-0.01287	Qual
Q5b	0.74018	0.49444	0.02837	Qual
Q5c	0.83585	0.35971	0.11008	Qual
Q13a	0.23055	0.82011	0.26544	Img
Q13b	0.46175	0.70601	0.27705	Img
Q13c	0.26005	0.85333	0.21465	Img
Q14	0.72811	0.40576	0.29555	CS

Varimax converged in 5 iterations.

Figure 6 - ACSI Model

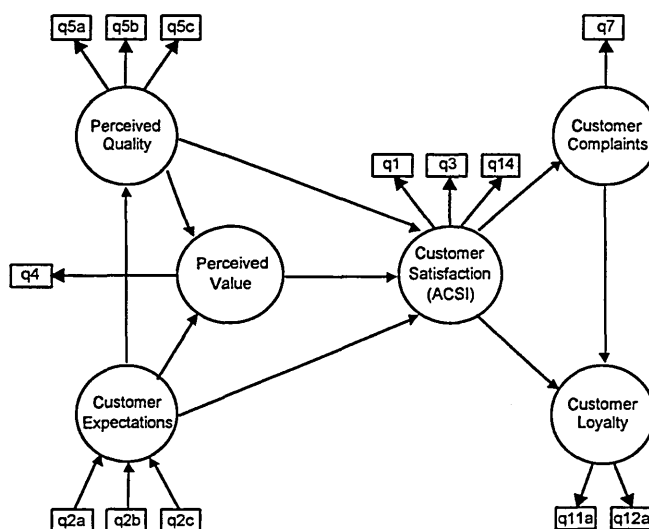


Figure 7 - Sheffield Model

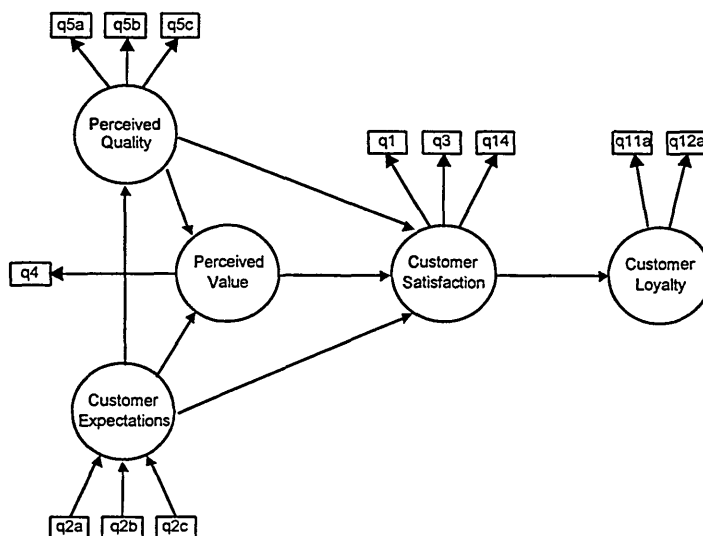


Figure 8 - European Model

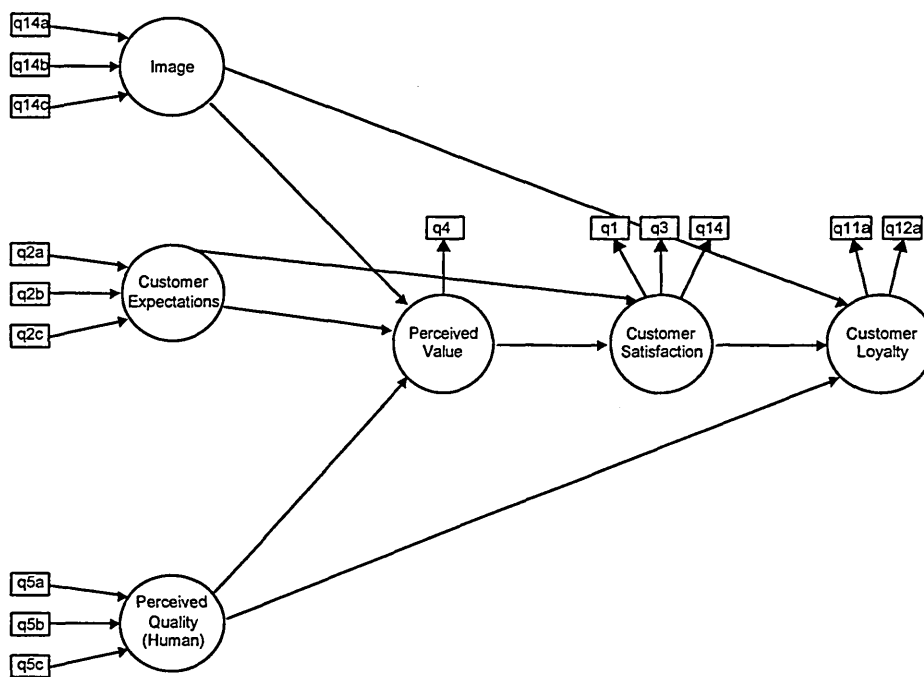


Table 9 - Comparisons of the different SEM results (sample size = 221)

Dimension (calculated by PLS)	ACSI Model	Sheffield Model	European Model
Perceived Quality	72.9	72.9	69.1
Customer Expectations	65.4	65.4	65.2
Image	N \ A	N \ A	73.0
Perceived Value	55.1	55.1	55.1
Customer Satisfaction	58.9	58.8	58.7
Complaints	79.7	N \ A	N \ A
Loyalty	71.44	71.44	71.44

Figure 9 - Path Co-efficient, ACSI Model

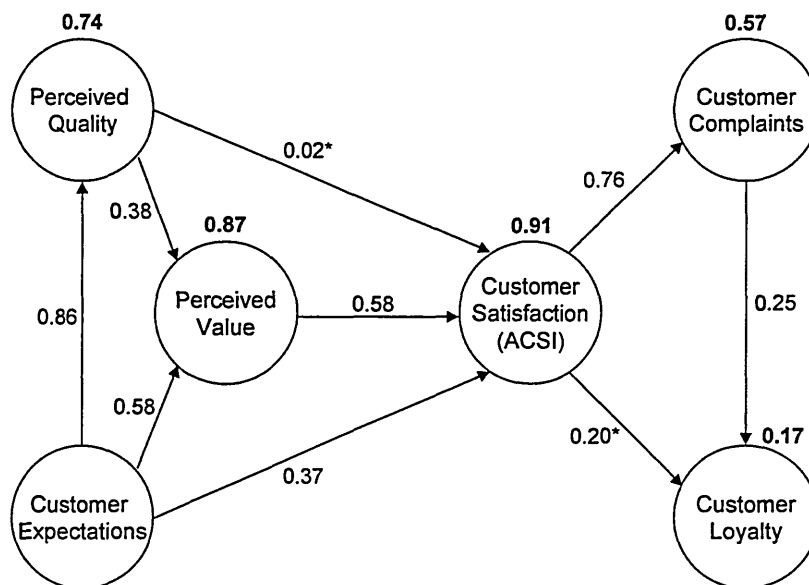


Figure 10 - Path Co-efficient, Sheffield Model

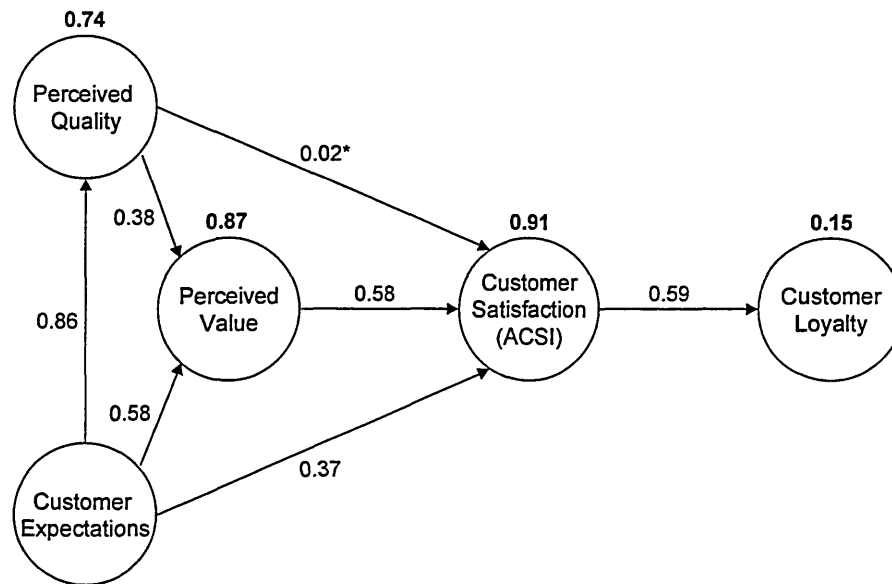


Figure 11 - Path Co-efficient, ECSI Model

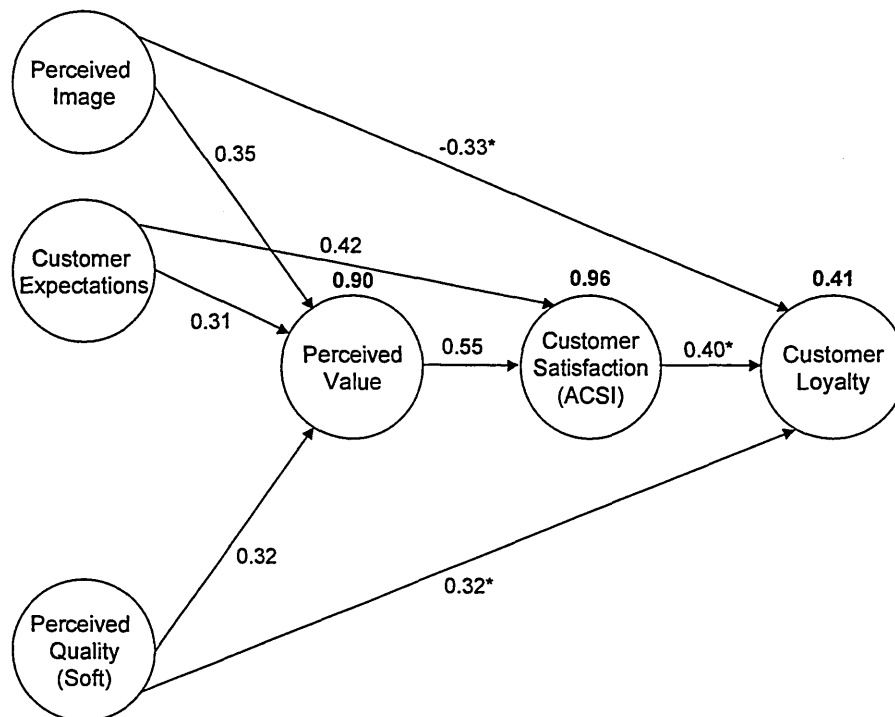


Table 10 - Comparisons of the different SEM results (sample size = 97)

Dimension (calculated by PLS)	ACSI Model	Sheffield Model	European Model
Perceived Quality	69.3	69.3	67.8
Customer Expectations	57.9	57.9	58.2
Image	N \ A	N \ A	63.2
Perceived Value	52.8	52.8	52.8
Customer Satisfaction	54.1	54.1	53.3
Complaints	84.3	N \ A	N \ A
Loyalty	51.6	51.6	51.6

Figure 12 - Path Co-efficient, ACSI Model

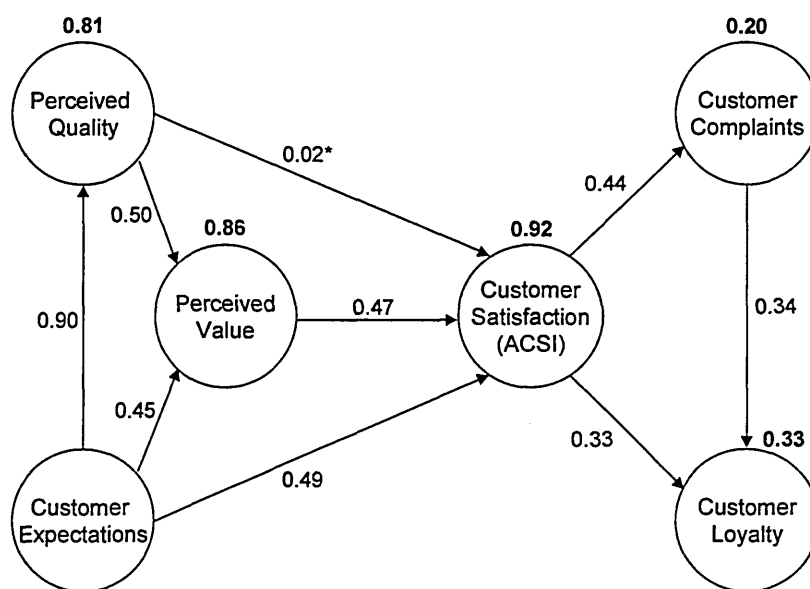


Figure 13 - Path Co-efficient, Sheffield Model

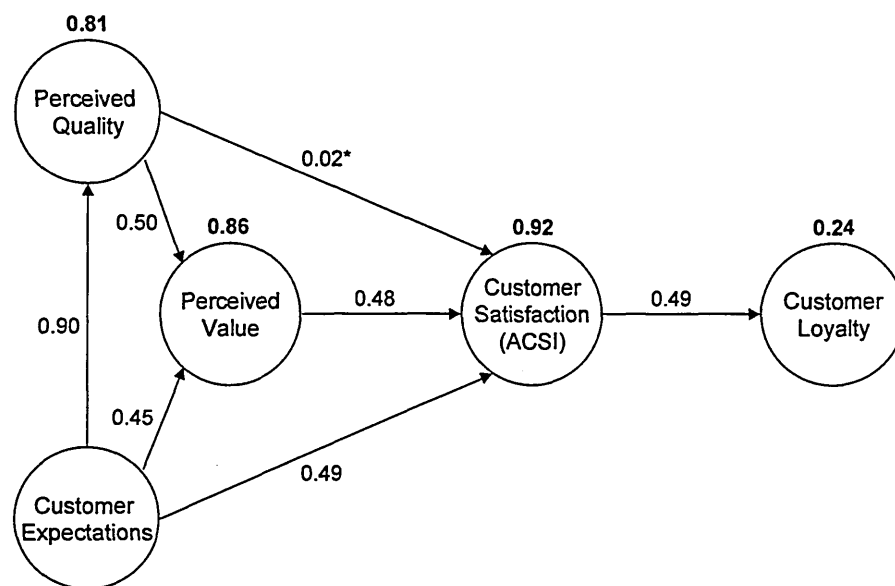
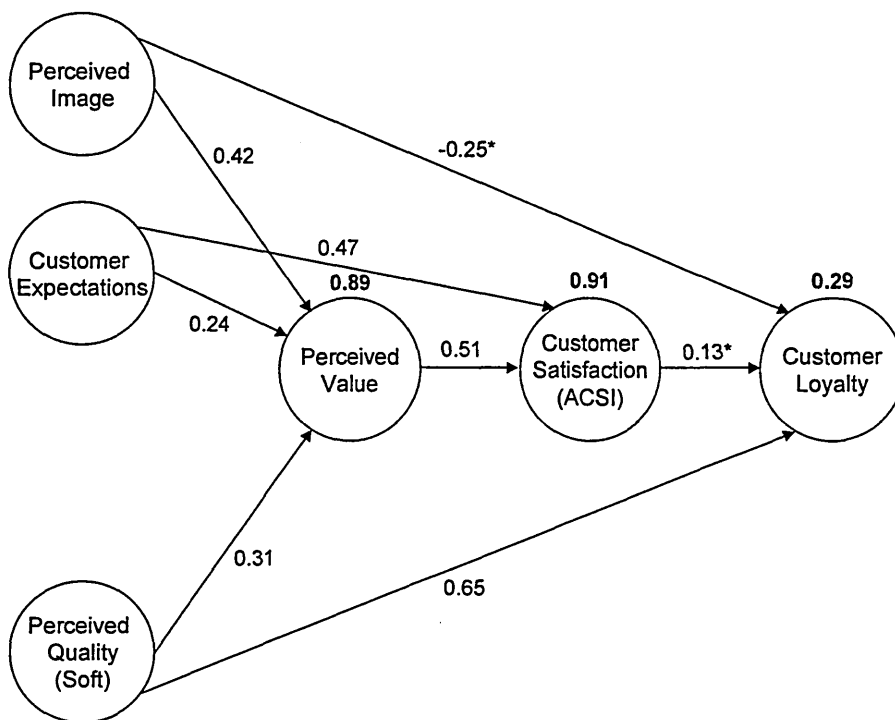


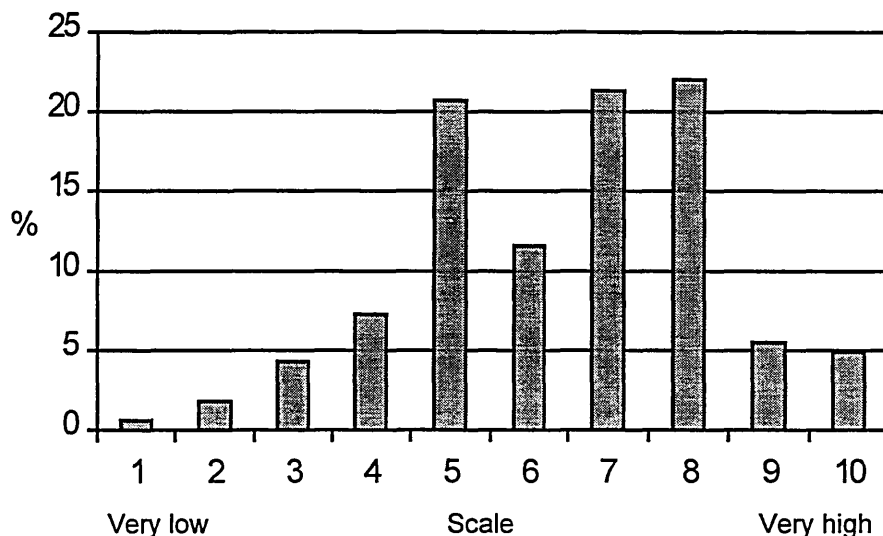
Figure 14 - Path Co-efficient, ECSI Model



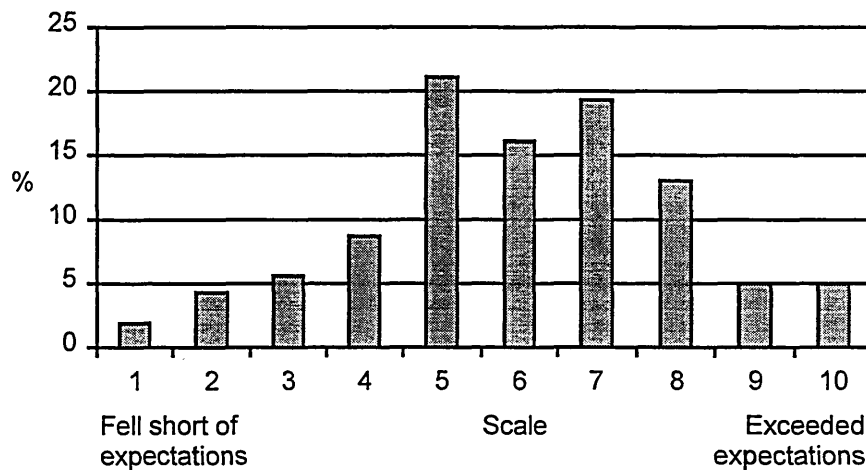
Appendix 12 - Results by question, SYP (1997)

In this appendix there is a graphical representation of the results from each question. The results for the sliding scale questions are all shown before any data cleaning was carried out.

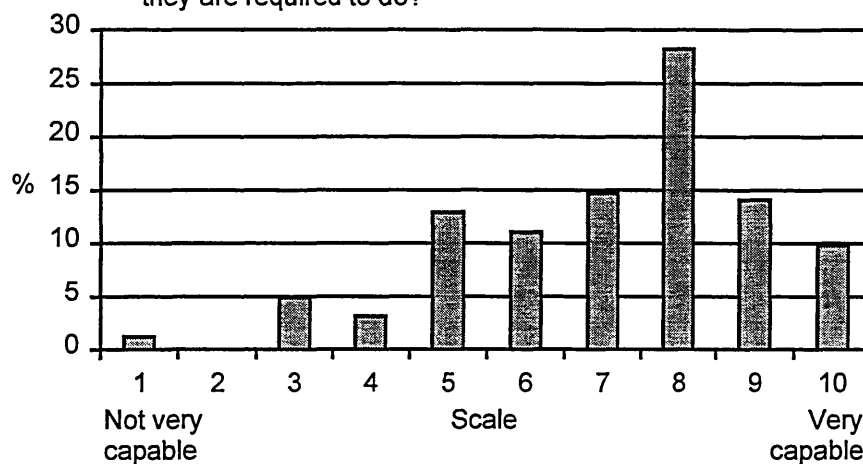
- Question 1)** - Please think back to before your contact with South Yorkshire Police (SYP). What were your overall expectations with regard to the services that would be provided. Were your expectations high or low?



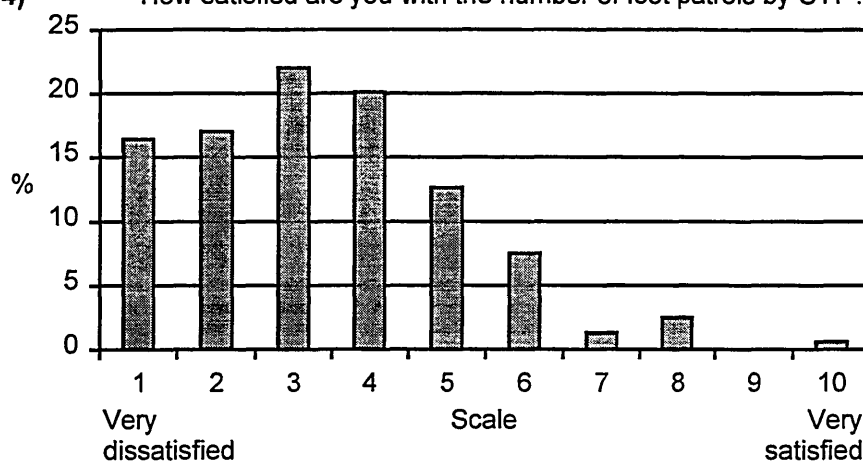
- Question 2)** - In relation to services from SYP, to what extent did SYP fall short of, or, exceed your expectations?



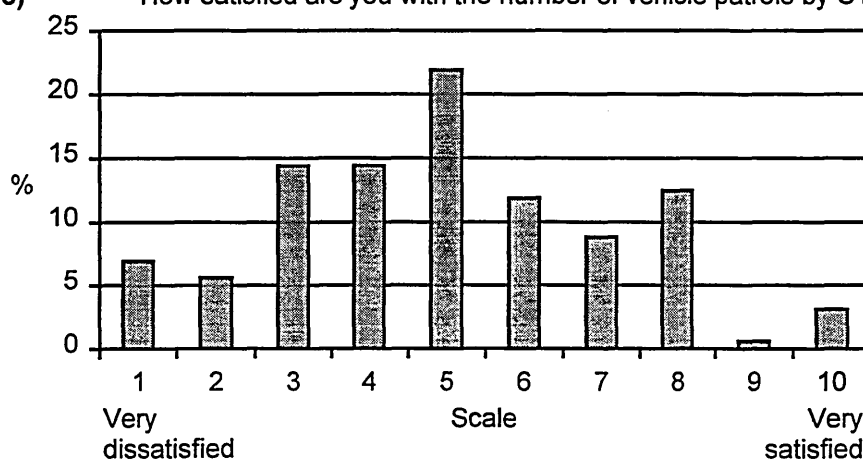
Question 3) - How capable would you say that the staff of SYP are, in terms of the job they are required to do?



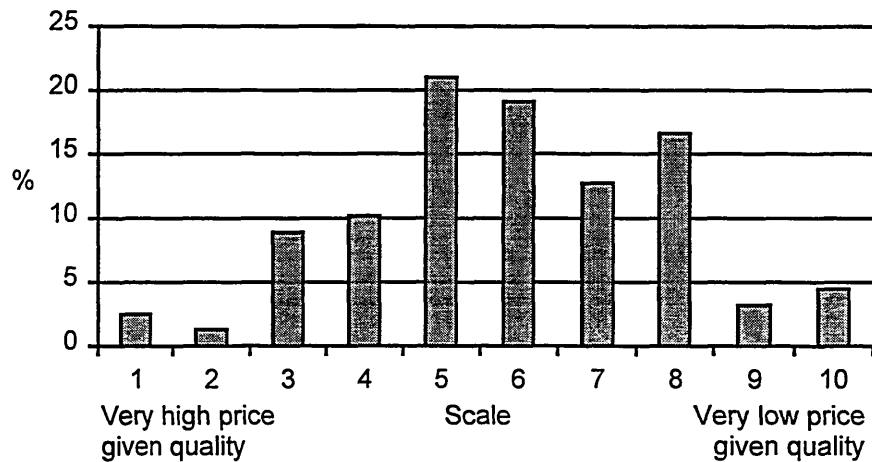
Question 4) - How satisfied are you with the number of foot patrols by SYP?



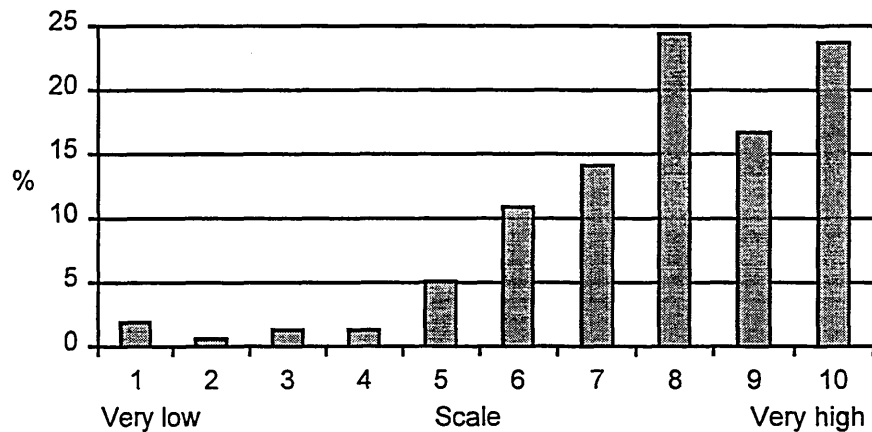
Question 5) - How satisfied are you with the number of vehicle patrols by SYP?



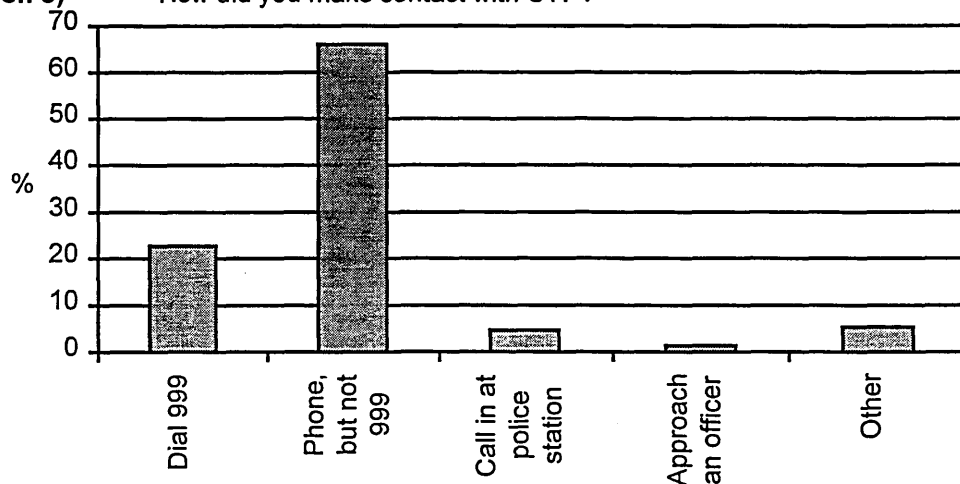
- Question 6)** - For the year 1996/97, the average council tax bill was £723.61, of this, £45.80 went towards the services provided by South Yorkshire Police. How would you rate the cost compared to the quality of service that you received?



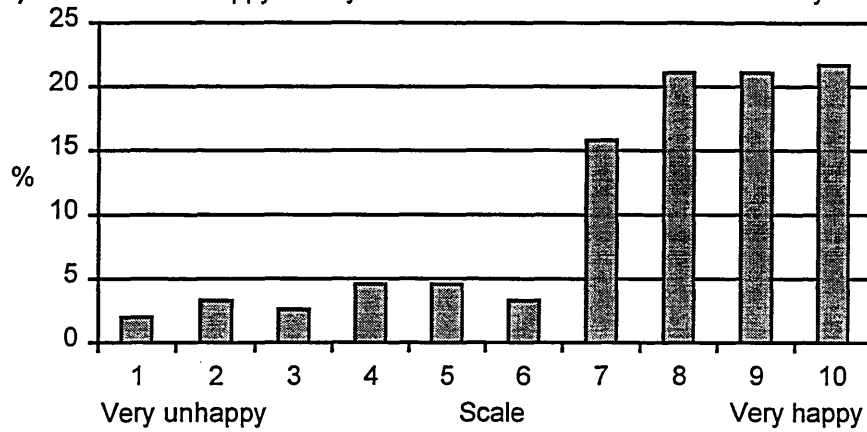
- Question 7)** - How important to you is quality in relation to the services provided by SYP?



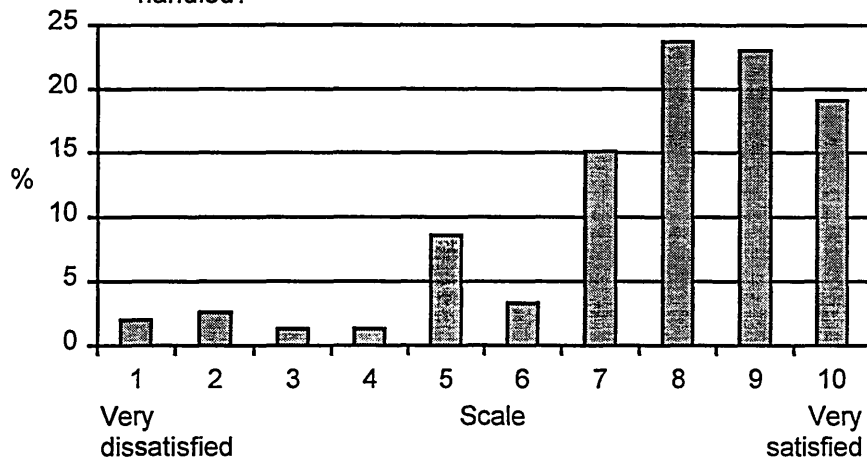
- Question 8)** - How did you make contact with SYP?



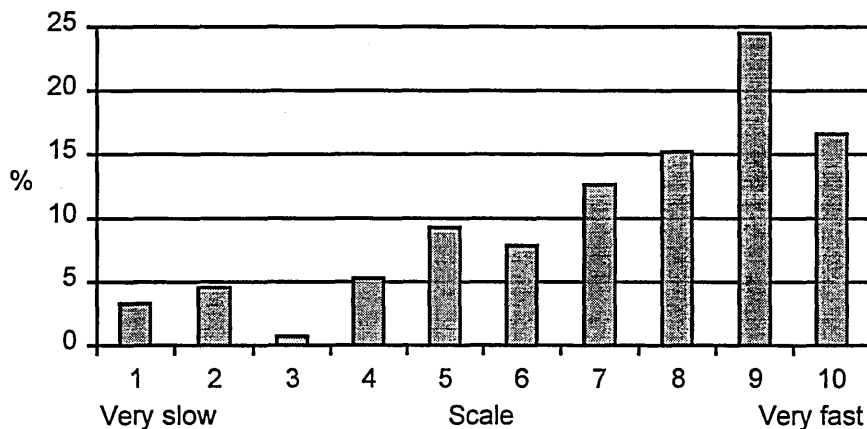
Question 9) - How happy were you with the time it took SYP to answer your call?



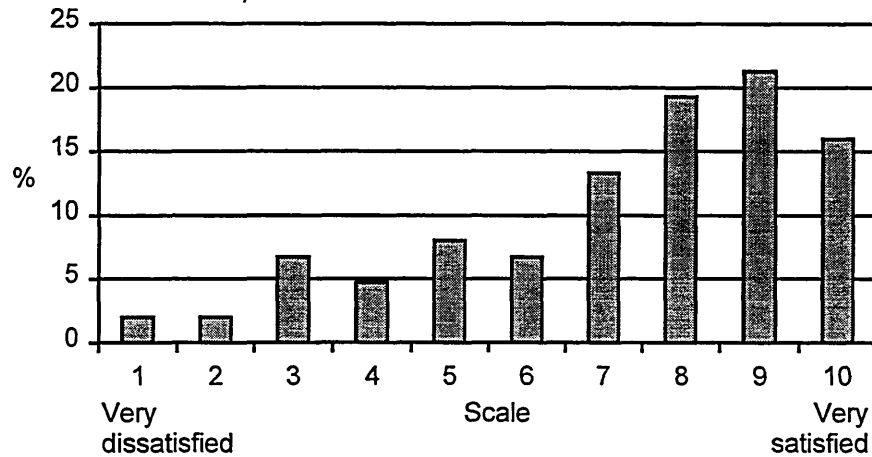
Question 10) - How satisfied were you with the way the call (not the incident) was handled?



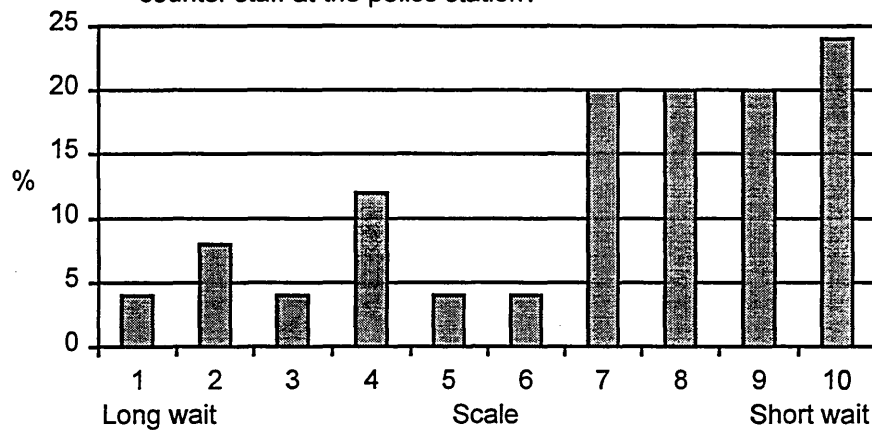
Question 11) - In your opinion, was SYP's response time to the call (not the incident) fast or slow?



Question 12) - How satisfied were you with the way the incident (not the eventual outcome) was handled?

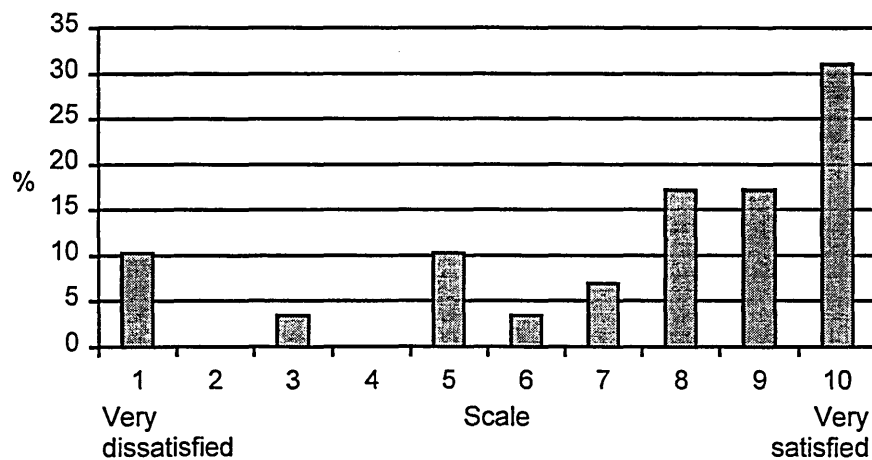


Question 13) - In your opinion, did you have to wait long before you were served by the counter staff at the police station?



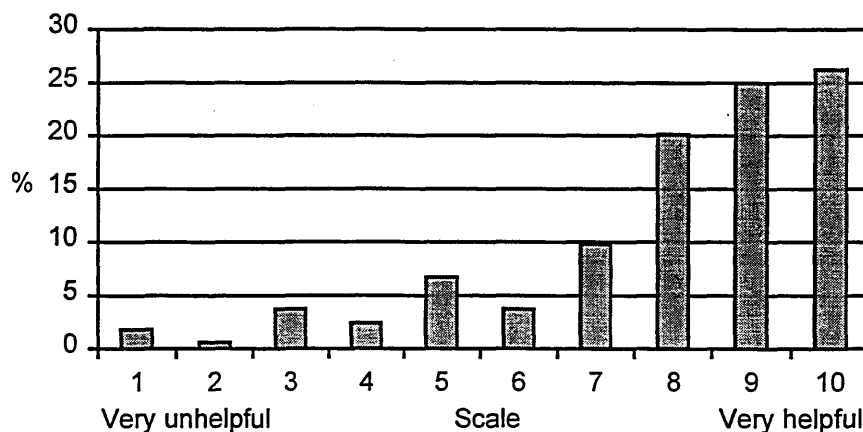
Sample Size 25.

Question 14) - How satisfied were you with the way your enquiry (not the eventual outcome) was handled?

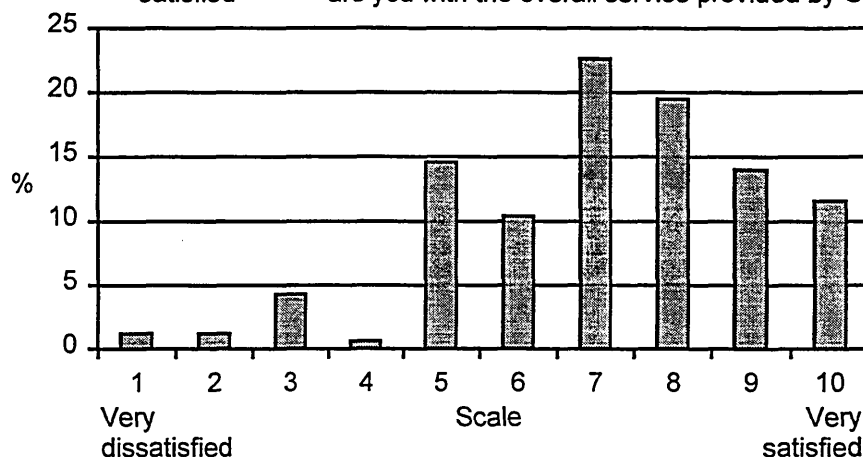


Sample Size 29.

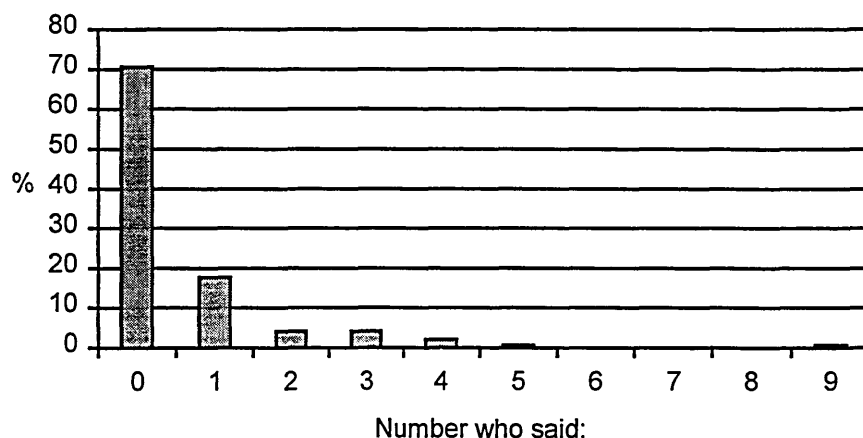
Question 15) - Thinking back to the incident. How would you rate the police's attitude towards you? Would you have said that they were helpful or unhelpful?



Question 16) - Please consider all your experiences up to date with the SYP. How satisfied are you with the overall service provided by SYP?

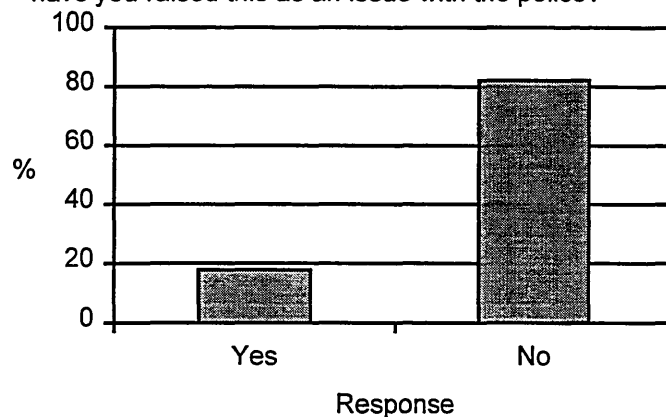


Question 17) - During the last year, how many times (if any) have you been less than satisfied with SYP services?

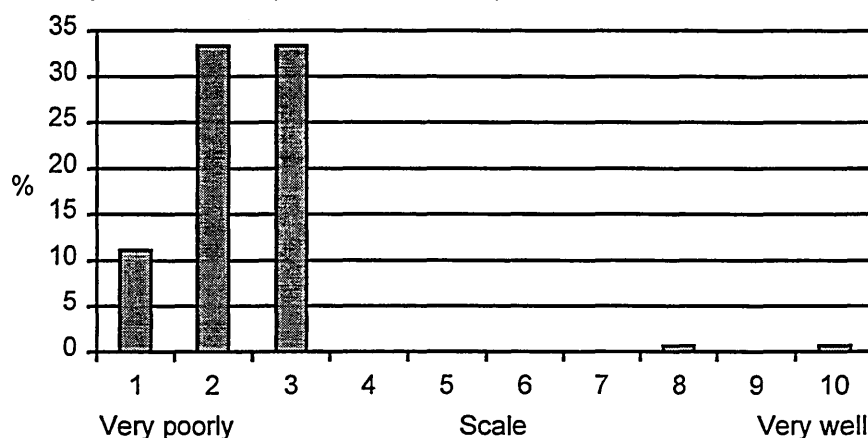


Question 18) asked for comments. See appendix 13 for more details.

Question 19) - During the last year, if you have been less than satisfied with the SYP, have you raised this as an issue with the police?



If yes, how would you rate the way in which the complaint was handled?



Sample Size 9.

Question 20) - In the last year, how many times have you received service from SYP with which you have been pleased? (If none (0), go to question 22).

118 people indicated that they had received service with which they had been pleased.

Question 21) - When you have had an experience that has pleased you, with how many people have you discussed it?

85 people indicated that they had discussed their positive experience with at least one other person. Therefore, 72% of the people who received a service with which they were pleased, told someone else.

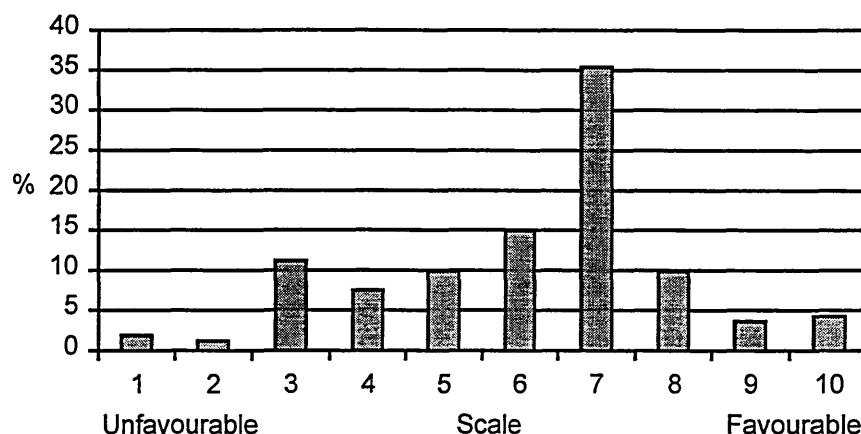
Question 22) - In the last year, how many times have you received service from SYP which has upset you? (If none (0), go to question 24).

18 people indicated that they had an interaction with which they were not pleased.

- Question 23)** - When you have had an experience that has upset you, with how many people have you discussed it?

16 people indicated that they had discussed their bad experience with at least one other person. Therefore 89% of the people who received a service with which they were not pleased, told someone else.

- Question 24)** - If you can imagine an ideal police force, how well do you think SYP compares with this ideal police force?



- Question 25)** - Are there any areas or issues connected with the Police in South Yorkshire you would like to make further comments about?

The comments that were received can be seen in Appendix 13.

Respondents Personal Data

Crime and District

The table below shows the breakdown for how the questionnaires were returned in accordance with each of the different districts and crime classifications.

Table - Returns by crime and district

	H	J	Total
Burglary	41	46	87
Car Crime	39	38	77
Total	80	84	164

Age of Respondents

The table below shows the break down of respondents by age group for the two categories of crime:

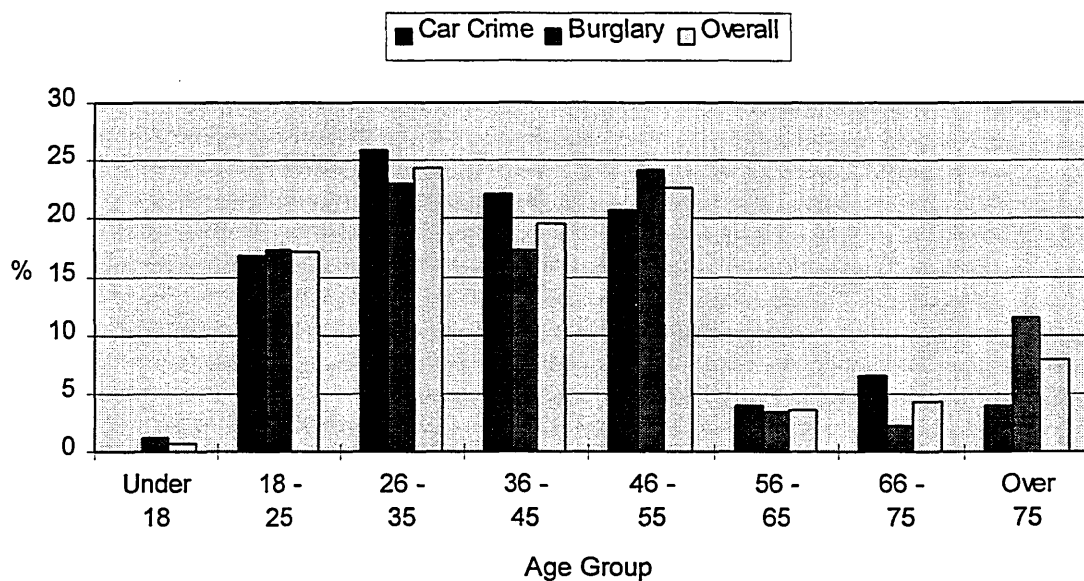
Table - Percentage response by age group

Age Group	Car Crime		Burglary		Total	
	No.	%	No.	%	No.	%
Under 18	0	0	1	1.15	1	0.61
18 - 25	13	16.88	15	17.24	28	17.07
26 - 35	20	25.97	20	22.99	40	24.39
36 - 45	17	22.08	15	17.24	32	19.51
46 - 55	16	20.78	21	24.13	37	22.56
56 - 65	3	3.90	3	3.45	6	3.66
66 - 75	5	6.49	2	2.30	7	4.27
Over 75	3	3.90	10	11.49	13	7.93
Total	77	100.00	87	100.00	164	100.00

No non-response.

This can be simplified to the graph below (note columns displayed by percentage of category):

Graph - Percentage response by age group



Employment Status of Respondents

The graph below shows the employment status of the respondents as a percentage of the total.

Graph - Percentage response by employment status



Sample Size 163, one non-response.

Appendix 13 - Comments about SYP, 1997

(except for ones referring to more patrols)

The comments below were received in response to question 25) which asked:

"Are there any areas or issues connected with the police in South Yorkshire you would like to make further comments about?"

Twenty four people (14.6%) asked for more foot patrols while seven people (4.3%) asked for more vehicle patrols.

The wording as far as possible is directly copied off the questionnaires.

- No apparent strategy for actively hunting down criminals
- Making their presence known a bit more
- More personal contact and less paper offering personal support
- The telephone switchboard needs to change back from one switchboard to individual telephone numbers at each police station.
- I personally would pay double for a police force that is seen, the only time you see police is when they are responding to a crime incident. Also take the paperwork off the police and let them tackle crime instead of taking notes and details down.
- Not enough money spent on crime prevention and law enforcement. Considering their workload, they do a satisfactory job where crime is concerned. They excel themselves in circumstances of trauma which they demonstrated when my son had an accident. They are not supported well by the courts who should take a far tougher line with offenders.
- I think they should have patrol at night in cars 'cos there is a lot of people alone in their houses who are scared to go to bed 'cos of fear of being burgled.
- The excessive use of cautions or no further action. Arbitrary de-criminalisation of offences.
- Response time to calls - It took 2.5 hours for a police officer to come round following an attempted break in.
- Never seen any police foot patrols
- Quicker response time with break ins and attempted break ins. More intense search for wanted people.
- Not enough on the beat, and those that are spend too much time sat in zaw garages etc.
- I have had several encounters with SYP as my car has been broken into twice and my home has seen 3 break ins and 3 attempted break ins. On each occasion the police have been prompt in dealing with the details of the crimes and polite and friendly, offering good advice and follow up services if wanted. So in this way the force seems to run efficiently

but out of the 8 incidents I've been involved in (This is only four years living at my present address) there have only been 2 cases served and the offenders brought to trial and convicted.

- I do feel its down to money but they should also receive better back up from the CPS and the courts. This at least would help their attitudes. Please bring back zero tolerance
- Most police look at you as if you have or are committing a crime!! Some smile and that's just fine!!
- Disappointed that the culprit who stole my radio from the car appeared to be known to the police but is not brought to task.
- More control of children in and out of school. More checking children not in school in term time. More checking children out after 9.30 at night. More checking youths after 10.30 at night.
- Police seem more concerned about pulling people for driving offences to get fine money than tackling crimes like car theft and burglaries
- It is too easy for police to invoke the excuse "We can't do anything about this sort of crime" - relating to car crime that is repetitive.
- Certain police just aren't switched on to deal with or even to be 'seen' to be dealing with crime. The police force is a service and the public (its customers) should be treated as such when they are the victims of crime.
- Greater community policing - car crime too prevalent.
- When the police came to interview me at home I was highly satisfied and it took them just over a week to find the car after it had been stolen and I would like to thank the officers concerned.
- It is impossible for there is to be enough police officers to deal with all the crime, and there success rate in catching certain thieves is low (for the type of burglary in question) as a result.
- I used to live in London where I would hear many 'emergency' sirens. The policy in Sheffield seems to avoid sounding sirens if possible, I appreciate that.
- Targeting of constant offenders.
- Attempted burglary at my property. I was at work. Police did not think it necessary to contact me. Contacted by neighbour. I would have hated to come home cold to this without prior warning.
- Requires more resources - money and personnel.
- Not enough effort/time spent in preventing crime, e.g. burglary, vandalism - police are very good at admin. Tasks - insurance cover will solve everything. Need for more police working in the community. At present to see police watching for traffic travelling over 30 mph on their way to work in the morning is an appalling waste of tax payers money. It is not possible to speed to work in the morning in Sheffield.

-
- They should be able to tell the owners of recovered stolen vehicles where the vehicle has been taken to and whether it is drivable or not, by the means of one direct phone call to the owner personally.
 - It seems to me that SYP are severely restricted by the resources, both human and equipment, that they are allowed.
 - A higher profile use to be the 'norm'.
 - We must have more police patrols car theft is rife and nothing gets done.
 - Seem very good in public relations but reluctant to follow up minor crimes.
 - Why has money been wasted on a helicopter / team when there should be more police foot patrols?
 - Very few foot patrols and car patrols in this area, however, I appreciate that SYP have limited resources. They also have a difficult job and have multiple problems to tackle which is perhaps why foot patrols are a lower priority.
 - Neighbourhood watch - liaison officer very poor quality.
 - Was the money spent on a police helicopter worthwhile?
 - They can only do what their resources allow them to be able to do - More concentration on preventing problems before they arise.
 - Follow up non existent.
 - The police were extremely supportive and sympathetic although this has to be set against the fact that they had virtually nil expectation of apprehending the burglar.
 - I feel that the police do a good job, but we need more of them to be recruited for foot patrol. Also they must at times feel discouraged by the courts giving very lenient sentences or no sentences at all usually.
 - When on foot patrol not looking at car windscreens to see if tax has run out.
 - There should be more patrols at university accommodation / areas.
 - I would like to see more operations targeted at specific areas i.e. drug dealers, car theft, burglary.
 - I think if you are ringing them (not 999) they are difficult to get hold of. When my car was stolen and the car damaged I didn't expect anyone to be caught, but it would have been nice to know what was being done, if anything. Criminals realise they can do what they want and they only people that suffered were me and my family.
 - I had a break in earlier this year. I am 83 years old and this is the only time I've seen a police man in the 26 years I've lived in this council bungalow at Mosborough.
 - Generally a good service, response to calls can be slow, greater visibility could cut more petty crime.
 - The service we received following a burglary was much better than on a previous occasion a few years ago.
-

- I think the law should allow the police more power to deal with young offenders. I.e. when they are caught offending they are let out to offend time and time again. Can't anything be done about this?
- Good work in present climate / society. Some very professional, sensible, initiative police officers, if handling a specific job.
- While individual officers seem amiable and concerned, they and the organisation seem to have an agenda that doesn't match that of me and other local people.
- Need more information when reporting a call on timing and procedures, reference number and contact number of station referred to.
- When we had an attempted break in we were notified of progress and were told we would be notified again 2 months later, we are still waiting.
- The police found my stolen car - I signed a report. Later, however, I found out the car was still listed as stolen (about 4 weeks later) I was puzzled.
- I should like the police to have more power and children taught to respect policemen. They do a fine job in sometimes very difficult situations.

Appendix 14 - Correlation Results, SYP,1998

The tables below show the correlation's between the variables which feed into the exogenous latent variables (human quality, expectations and image) in the Structural Equation Model. The correlation's have only be calculated for the data set containing the results from Parts 1 & 2.

Table - Human Quality Vs Perceived Expectations

Expectations	Human Quality		
	Q5a	Q5b	Q5c
Q2a	0.2951 P=0.000	0.3798 P=0.000	0.3755 P=0.000
Q2b	0.4034 P=0.000	0.6348 P=0.000	0.7151 P=0.000
Q2c	0.4137 P=0.000	0.7241 P=0.000	0.7879 P=0.000

Table - Human Quality Vs Image

Expectations	Image		
	Q13a	Q13b	Q13c
Q2a	0.3646 P=0.000	0.4420 P=0.000	0.3948 P=0.000
Q2b	0.4805 P=0.000	0.6135 P=0.000	0.4959 P=0.000
Q2c	0.550 P=0.000	0.7046 P=0.000	0.5611 P=0.000

Table - Perceived Expectations Vs Image

Human Quality	Image		
	Q13a	Q13b	Q13c
Q5a	0.4679 P=0.000	0.4750 P=0.000	0.5431 P=0.000
Q5b	0.5349 P=0.000	0.6518 P=0.000	0.5568 P=0.000
Q5c	0.5224 P=0.000	0.6686 P=0.000	0.5265 P=0.000

Appendix 15 - Results by Question (SYP, 1998)

This appendix contains graphical representation for each of the questions. The results for each of the three parts are shown on each graph.

Number of usable questionnaires for each part of the survey are:

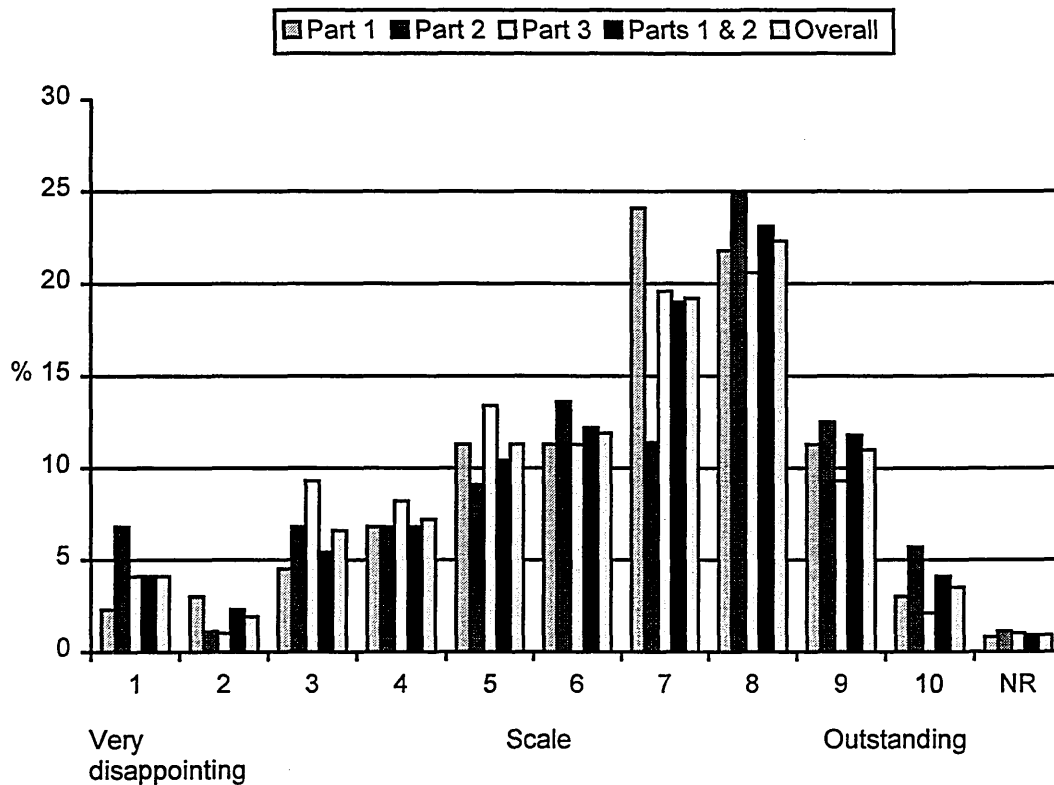
Part 1 - 133 out of 325 (40.1%)

Part 2 - 88 out of 267 (33.0%)

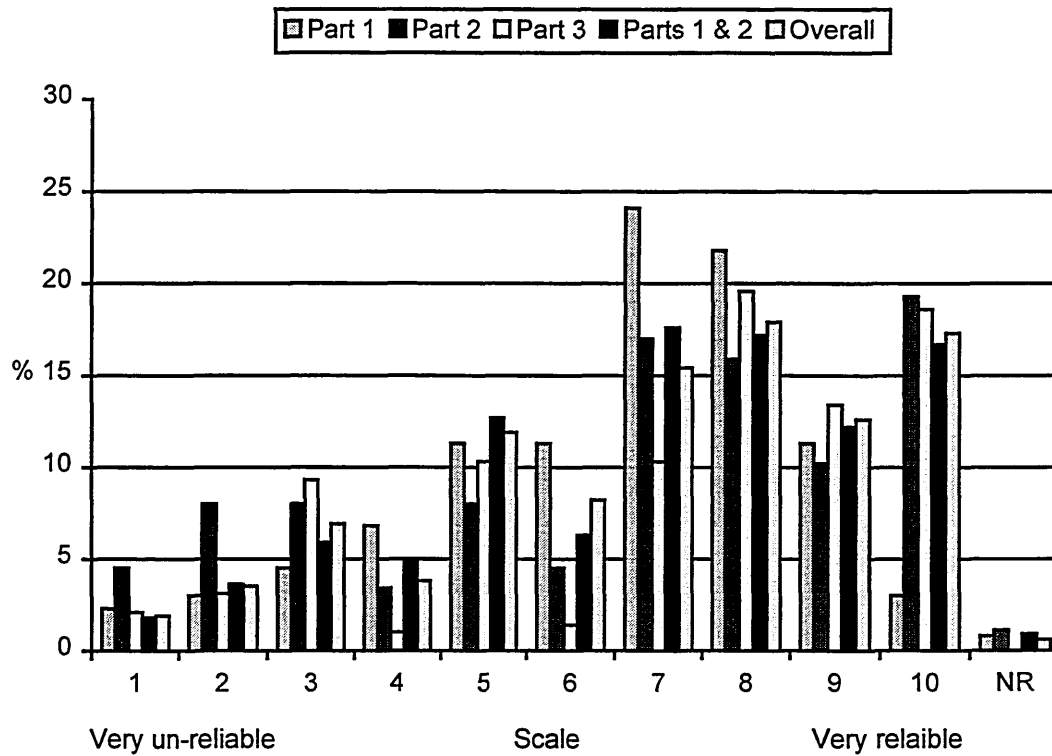
Part 3 - 97 out of 408 (23.8%)

The actual response rates were slightly higher than these, due to some questionnaires being returned un-completed.

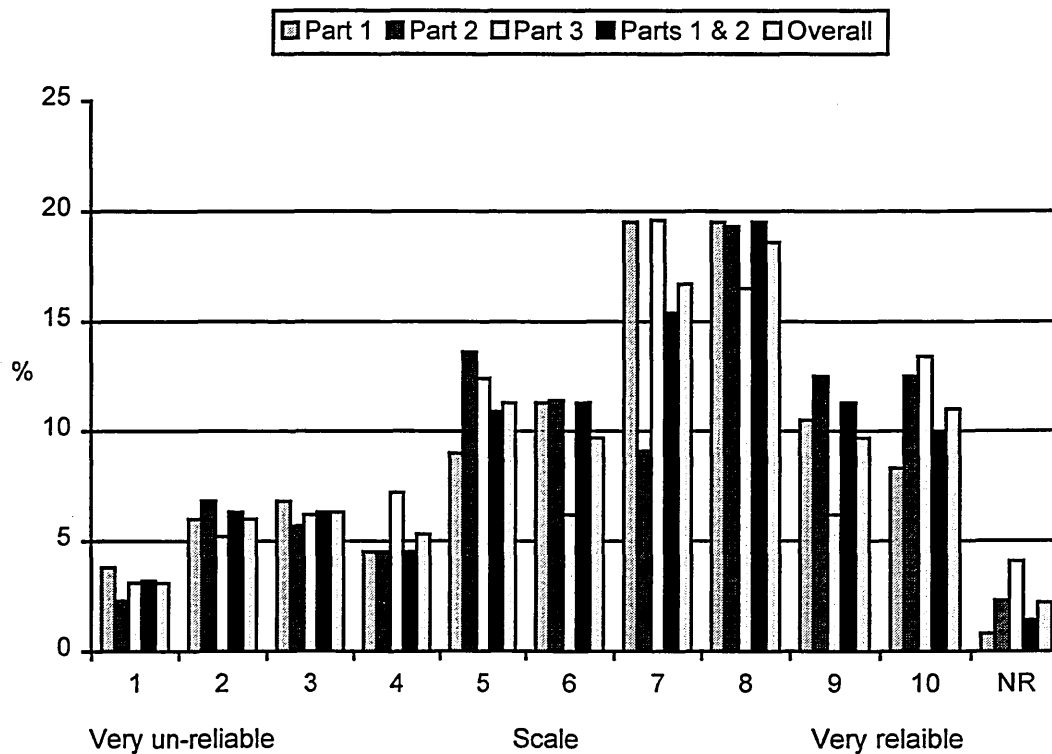
Question 1) - Thinking of your overall experience with SYP, all things considered, how would you describe your experience?



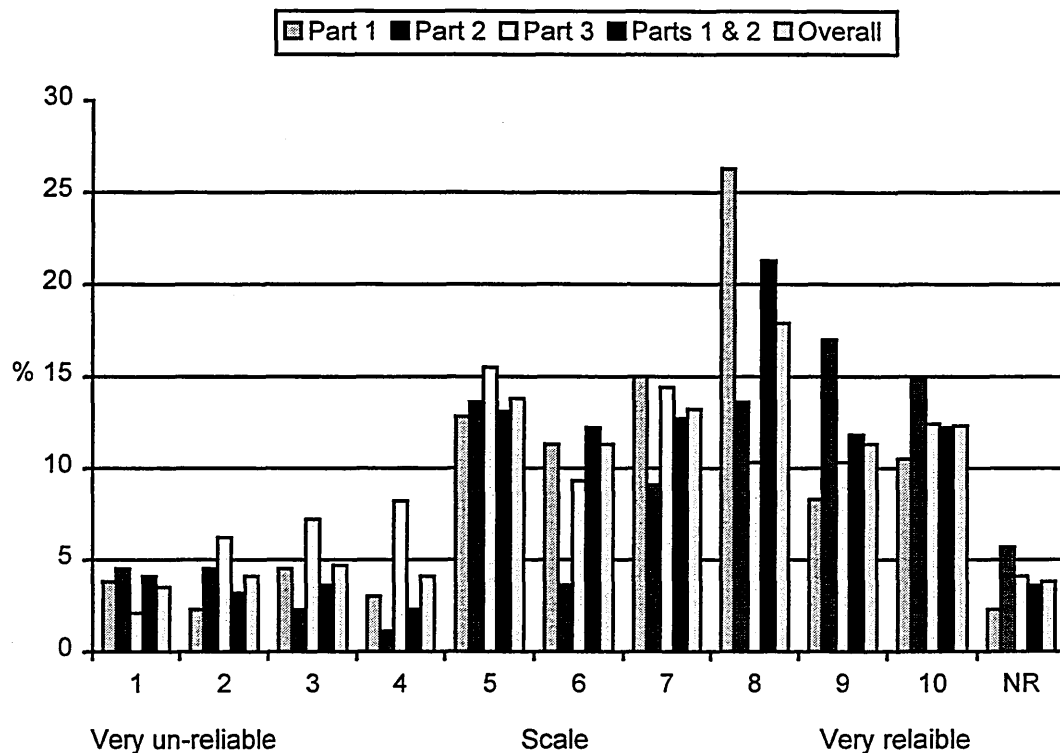
Question 2)a - From your past experience of SYP, how reliable would you say SYP are in terms of their speed in answering the telephone?



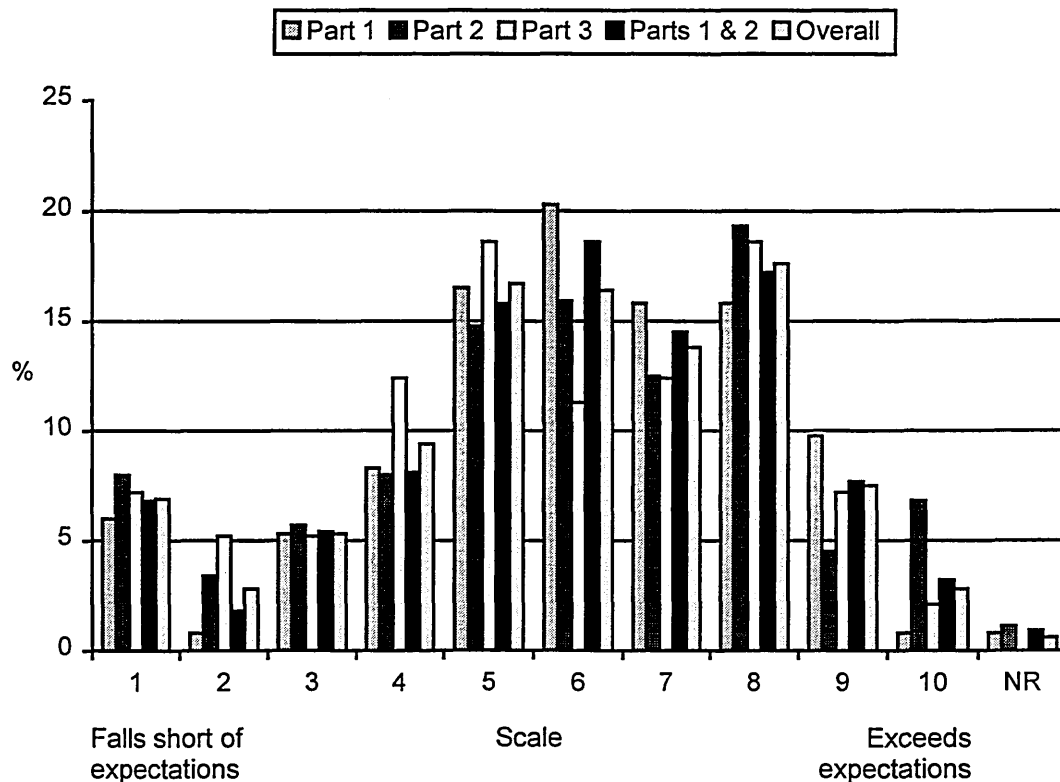
Question 2)b - From your past experience of SYP, how reliable would you say SYP are in terms of their speed in responding to an incident?



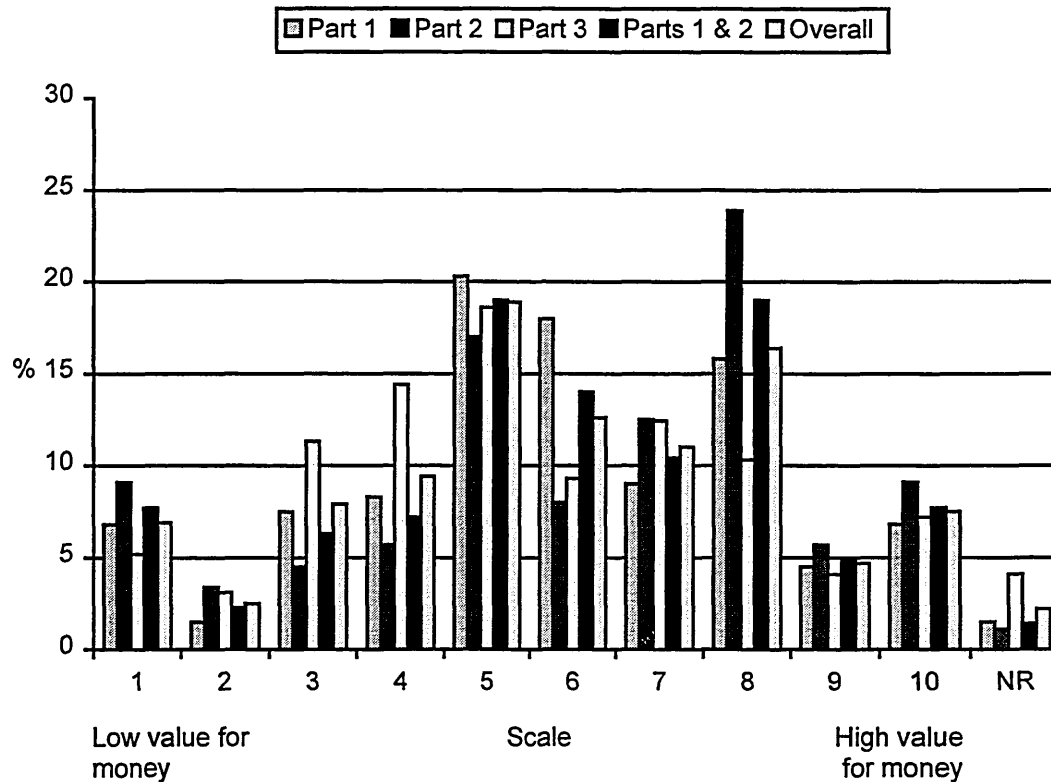
Question 2)c - From your past experience of SYP, how reliable would you say SYP are in terms of their service?



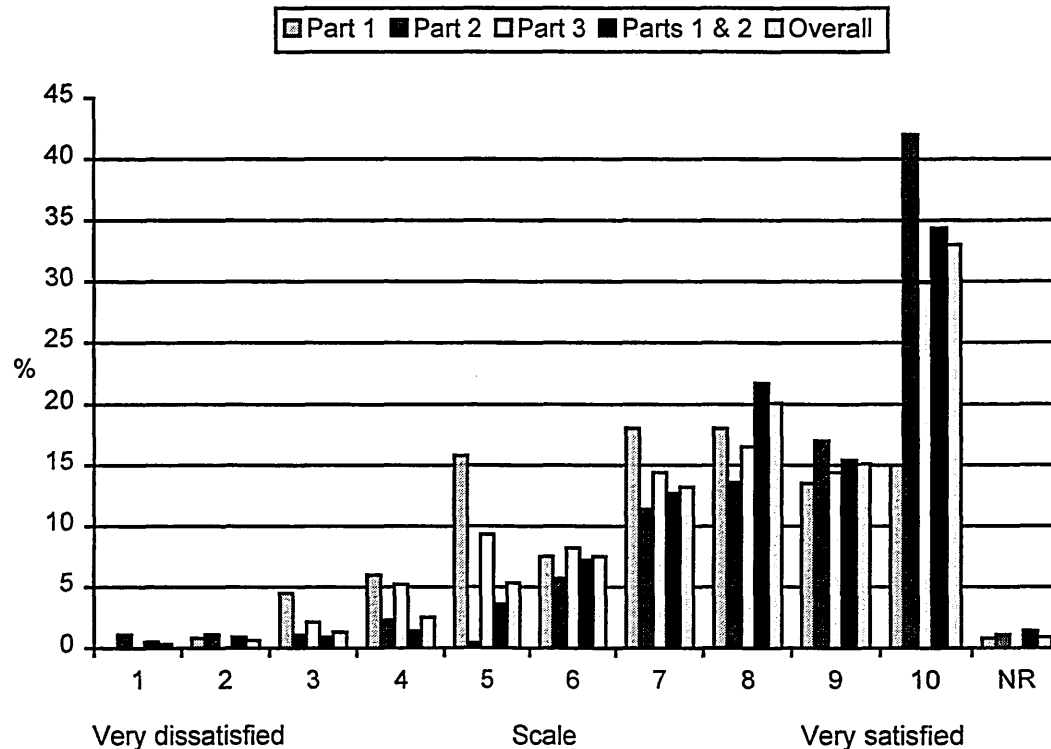
Question 3) - In relation to the services that you receive from SYP, to what extent have they fallen short of, or, exceeded your expectations?



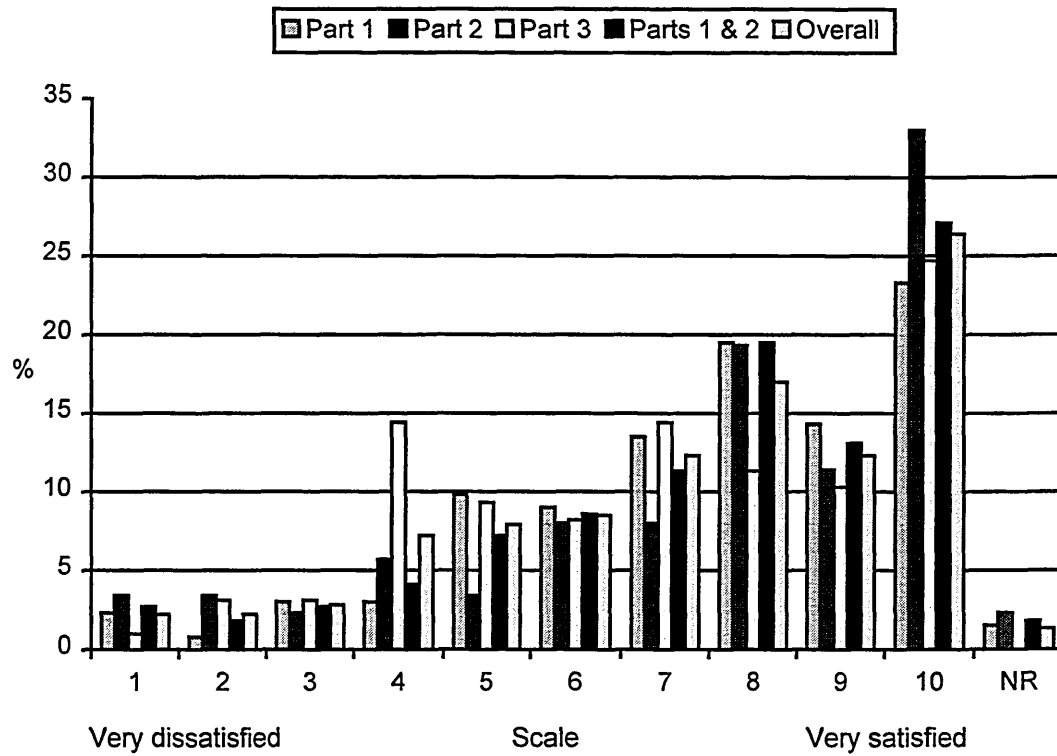
Question 4) - In 1998, 8.5% of the business rate tax went to pay for the police. Would you say this is low or high value for money?



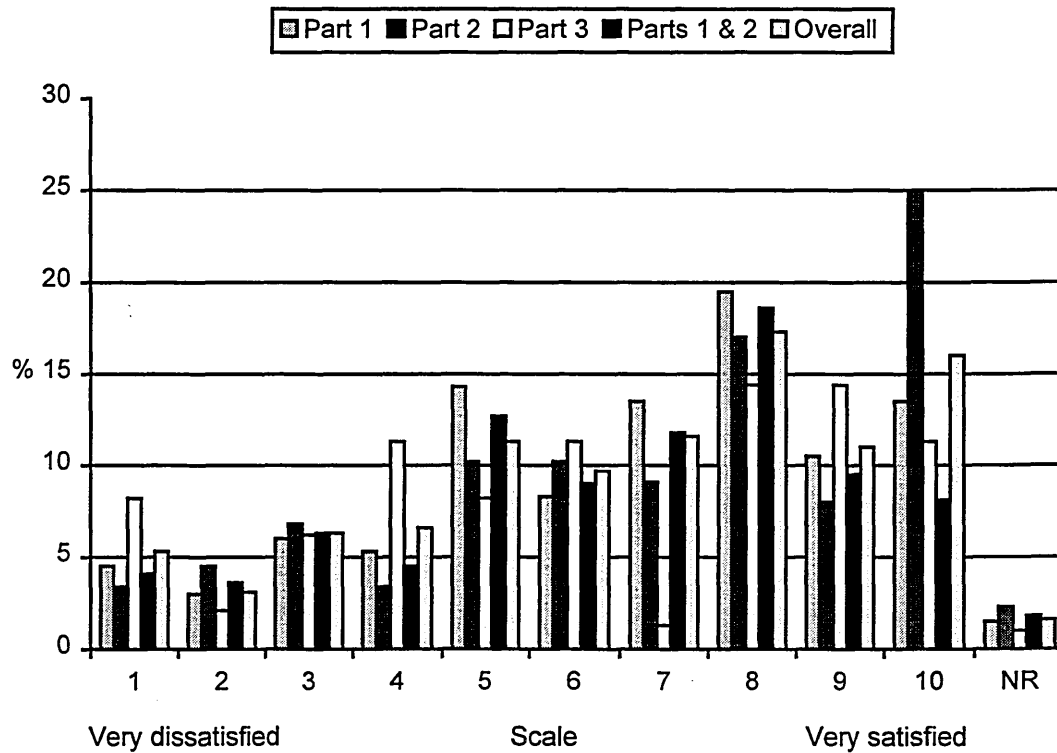
Question 5)a - How satisfied are you with the overall politeness of the police?



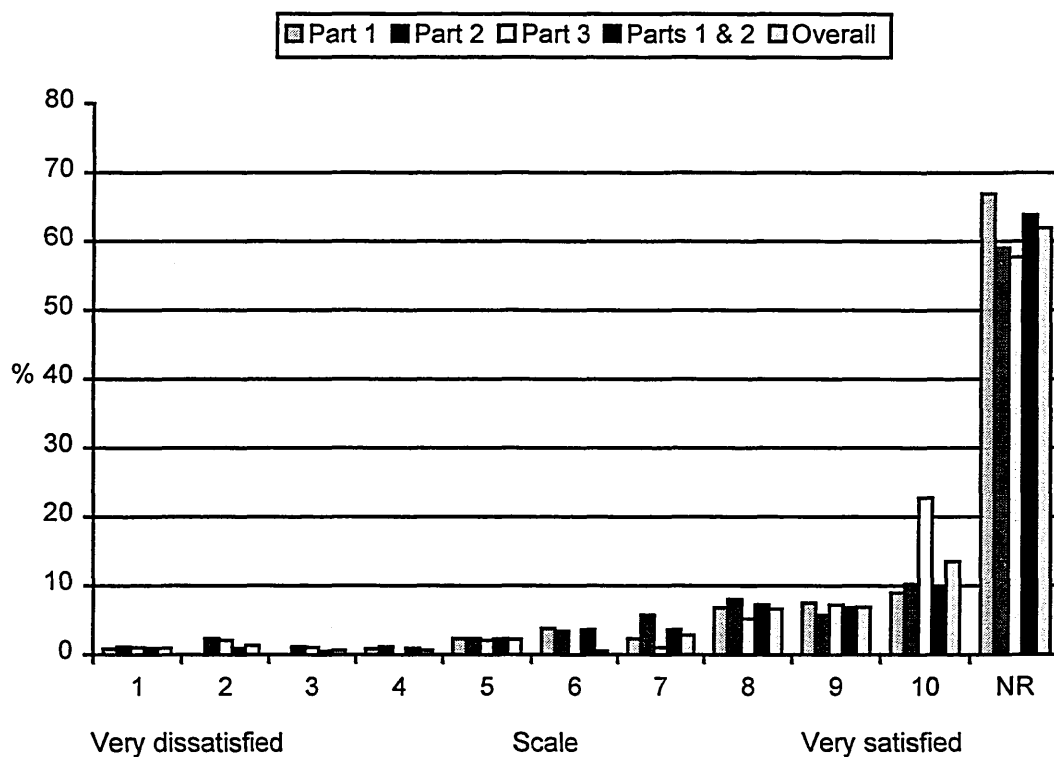
Question 5)b - How satisfied are you with the overall helpfulness of the police?



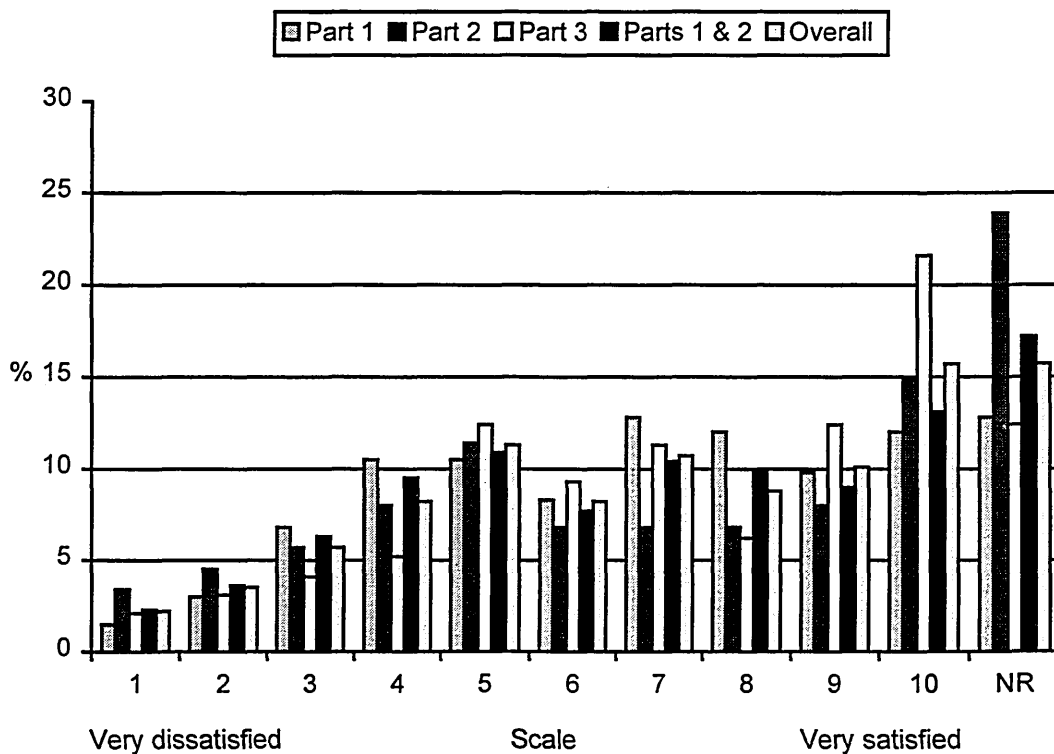
Question 5)c - How satisfied are you with the overall efficiency of the police?



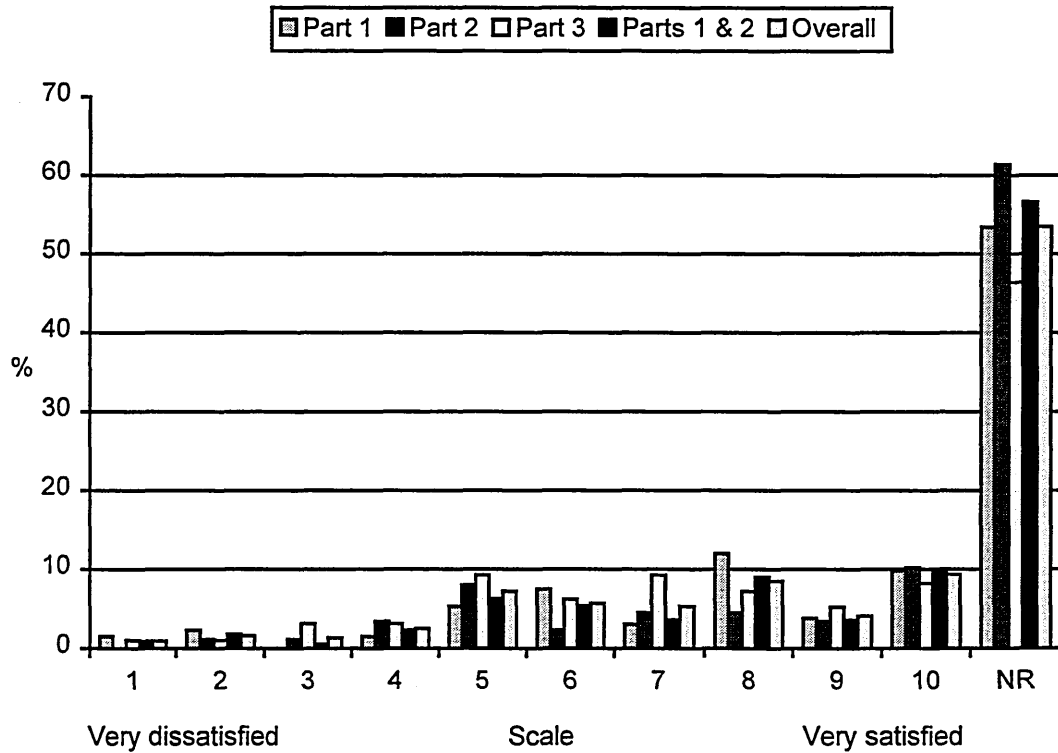
Question 6)a - How satisfied are you with the 999 telephone service?



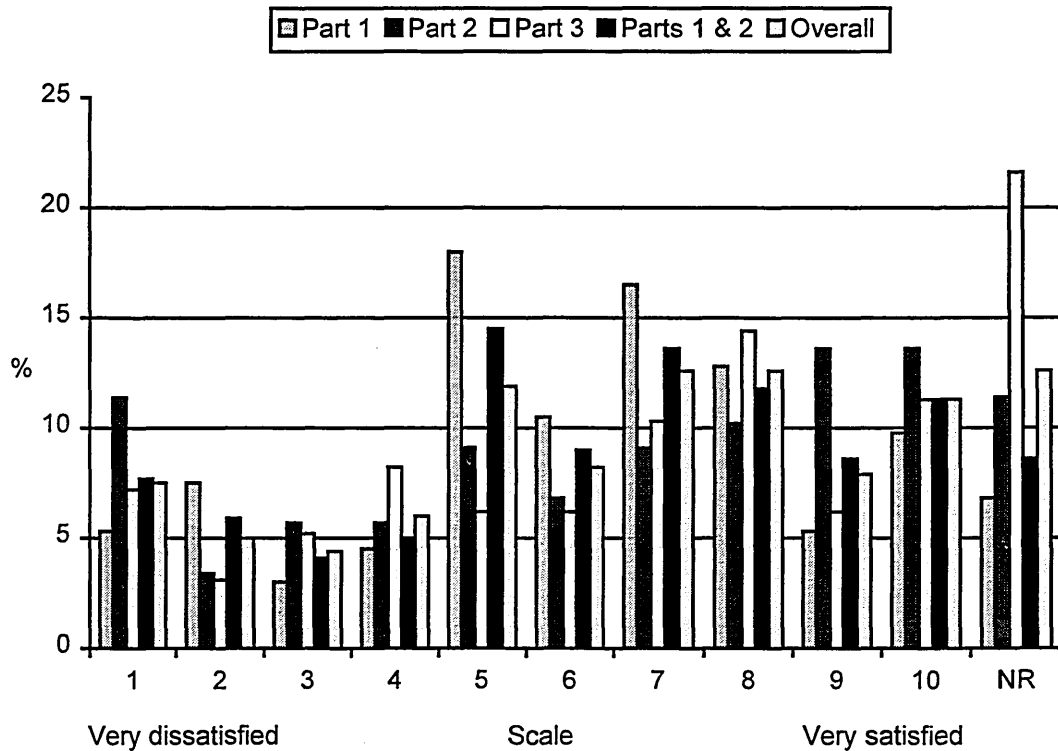
Question 6)b - How satisfied are you with the telephone service (not 999)?



Question 6)c - How satisfied are you with the police station counter service?



Question 6)d - How satisfied are you with how long it took an officer to arrive?



Question 7) - During the last year have you ever felt that you have had cause for complaint about SYP services?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	15.8	20.5	14.4	17.6	16.7
No	82.7	76.1	84.5	80.1	81.4
Non Response	1.5	3.4	1	2.3	1.9

Question 8) - Broadly what were these issues about?

A complete break down of the comments received can be seen in appendix 16.

Question 9) - Did you raise this as an issue with the police?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	9.8	3.4	4.1	7.2	6.3
No	6	15.9	10.3	10.0	10.1
Non Response	84.2	80.7	85.6	82.8	83.6

Question 10) - How would you rate the way in which the complaint was handled?

Question 11)a - In the last year, have you received service from SYP with which you have been pleased?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	70.7	70.5	52.6	70.6	65.1
No	21.4	27.3	39.2	25.3	29.6
Non Response	5.3	2.3	8.2	4.1	5.3

If 'Yes', have you discussed it with friends and acquaintances?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	47.4	52.3	34.0	49.3	44.7
No	24.1	17.0	16.5	21.3	19.8

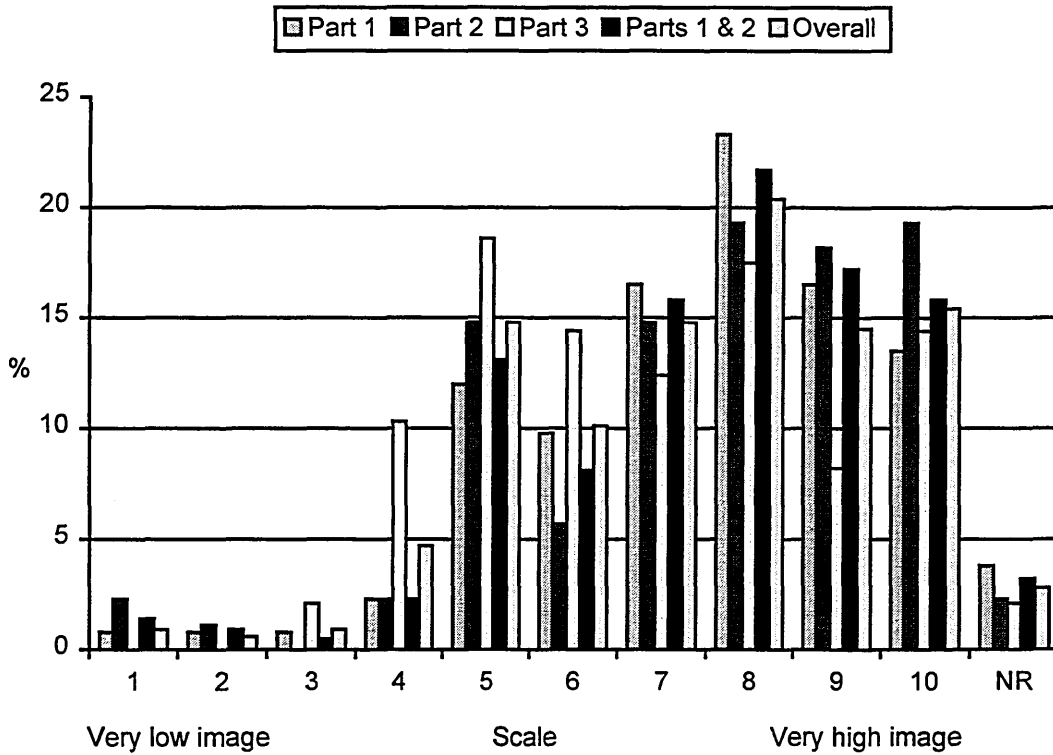
Question 12)a - In the last year, have you received service from SYP that has upset you?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	18.0	15.9	20.6	17.2	18.2
No	77.4	80.7	74.2	78.7	77.4
Non Response	4.5	3.4	5.2	4.1	4.4

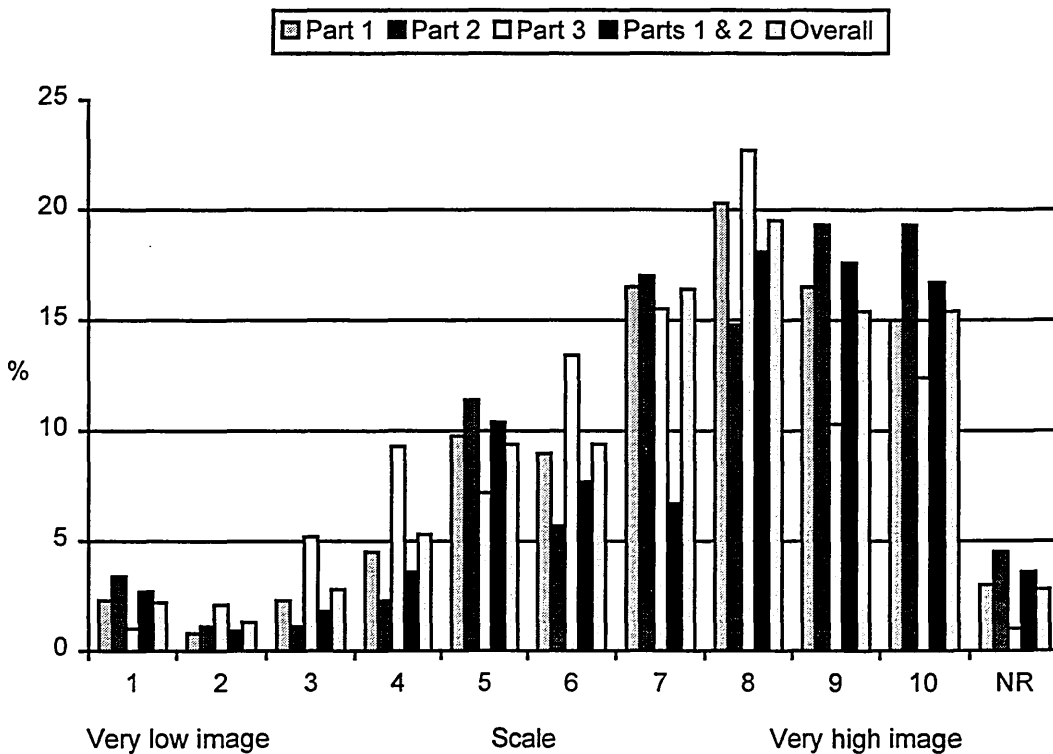
If 'Yes', have you discussed it with friends and acquaintances?

	Part 1 (%)	Part 2 (%)	Part 3 (%)	Parts 1 & 2 (%)	Overall (%)
Yes	15.0	14.8	18.6	14.9	16.0
No	12.8	1.1	2.1	8.1	6.3

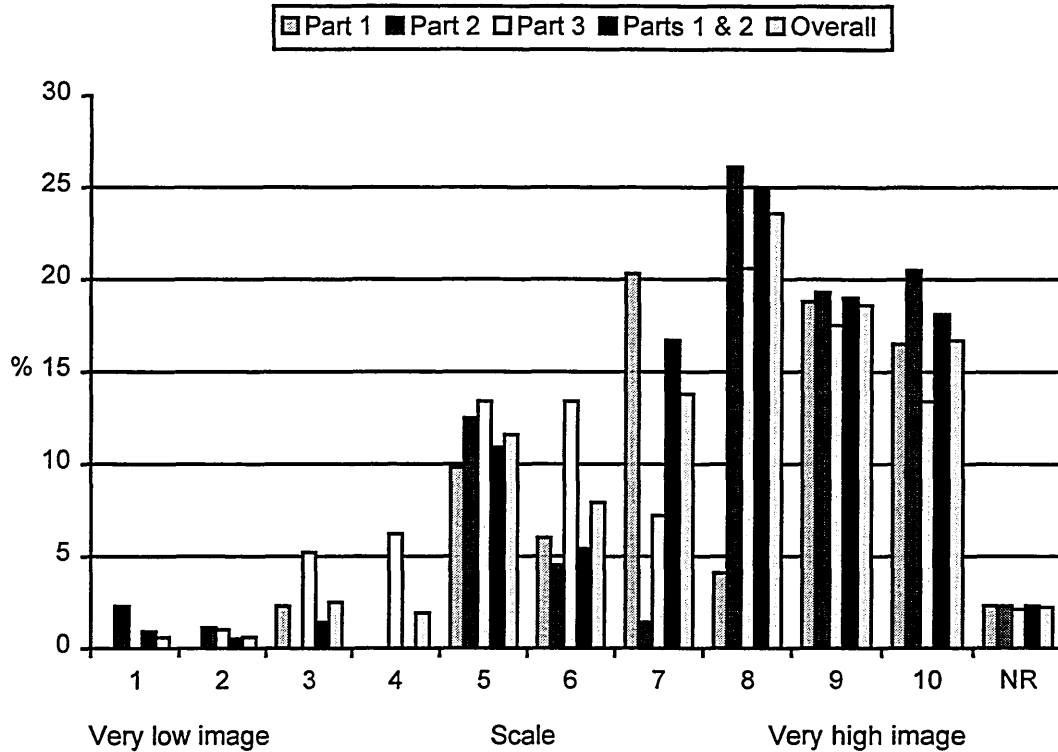
Question 13)a - How would you rate the image of SYP in terms of being honest?



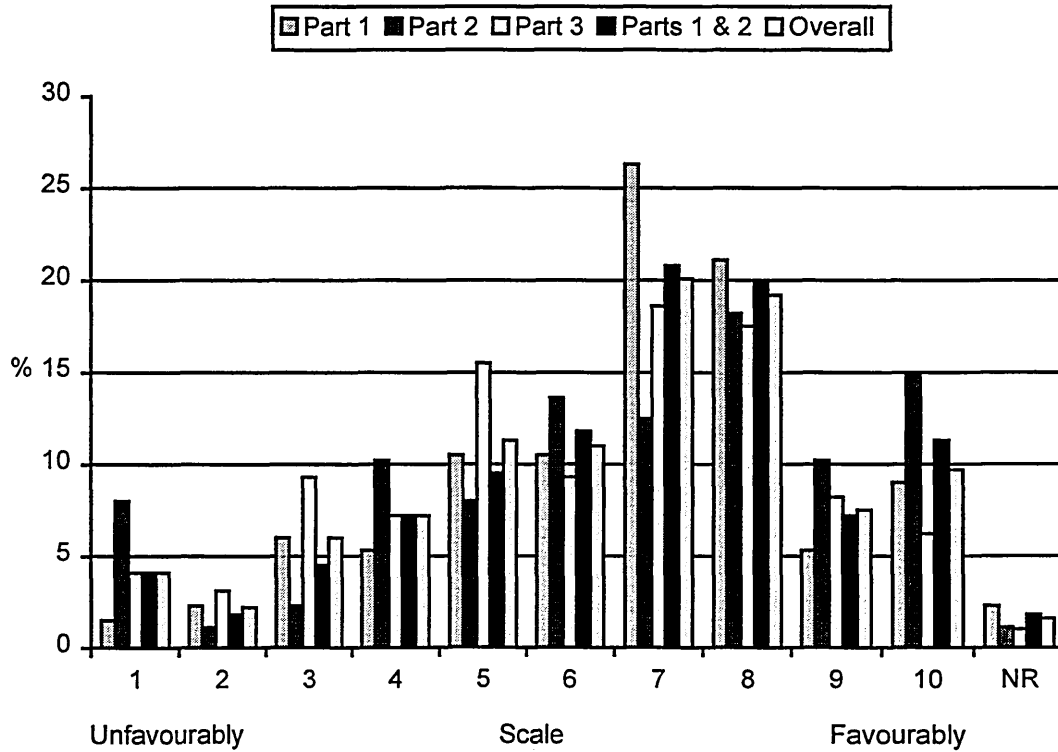
Question 13)b - How would you rate the image of SYP in terms of being professional?



Question 13)c - How would you rate the image of SYP in terms of being friendly?



Question 14) - If you can imagine an ideal police force, how well do you think SYP compares with this?

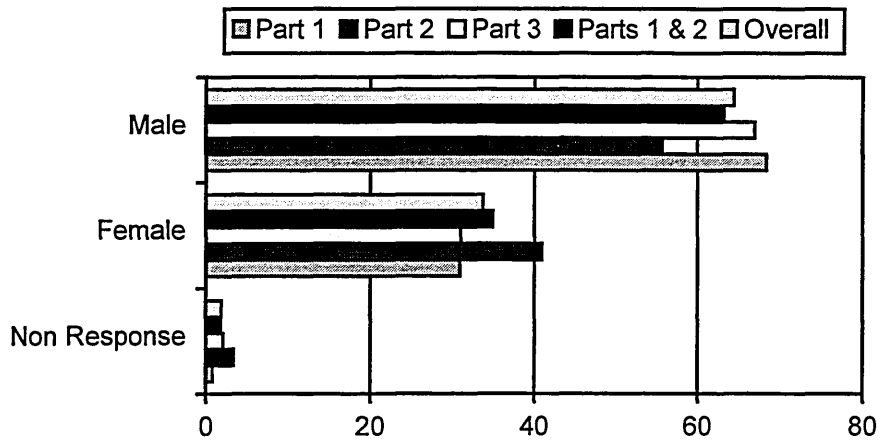


Question 15) - Are there any other areas or issues connected with SYP that you would like to make further comments about?

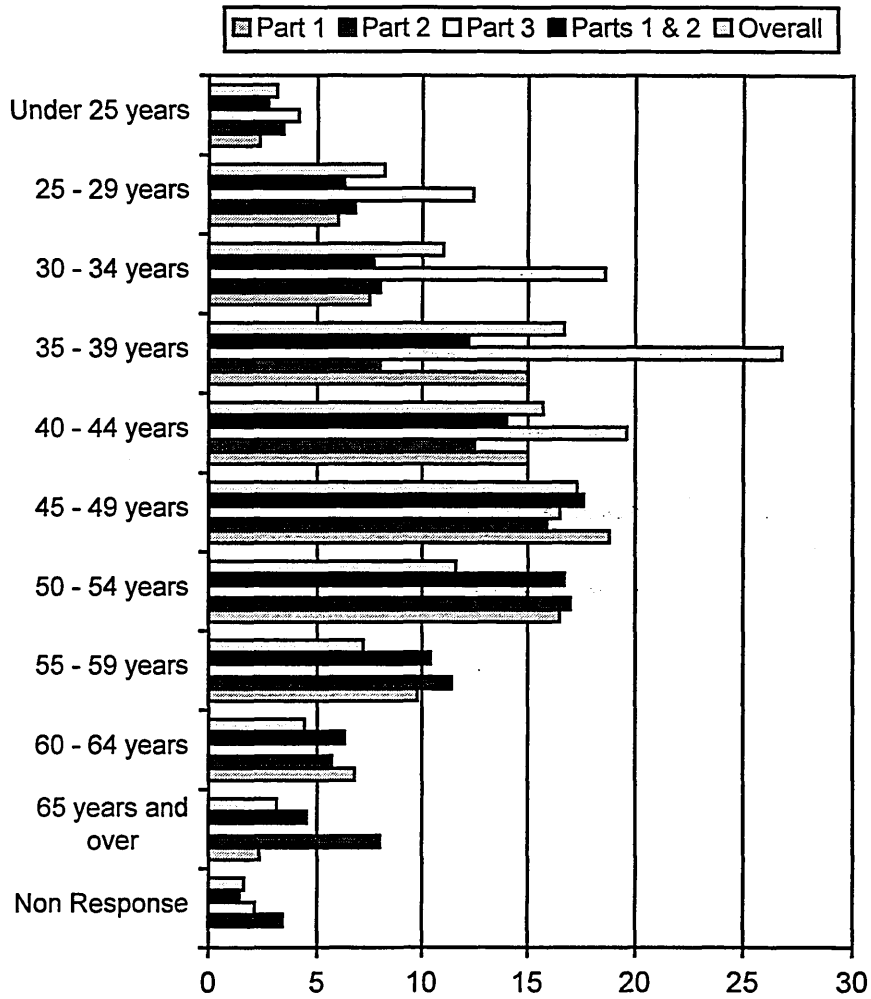
For a complete break down of the comments received, please see appendix 17.

Personal Details

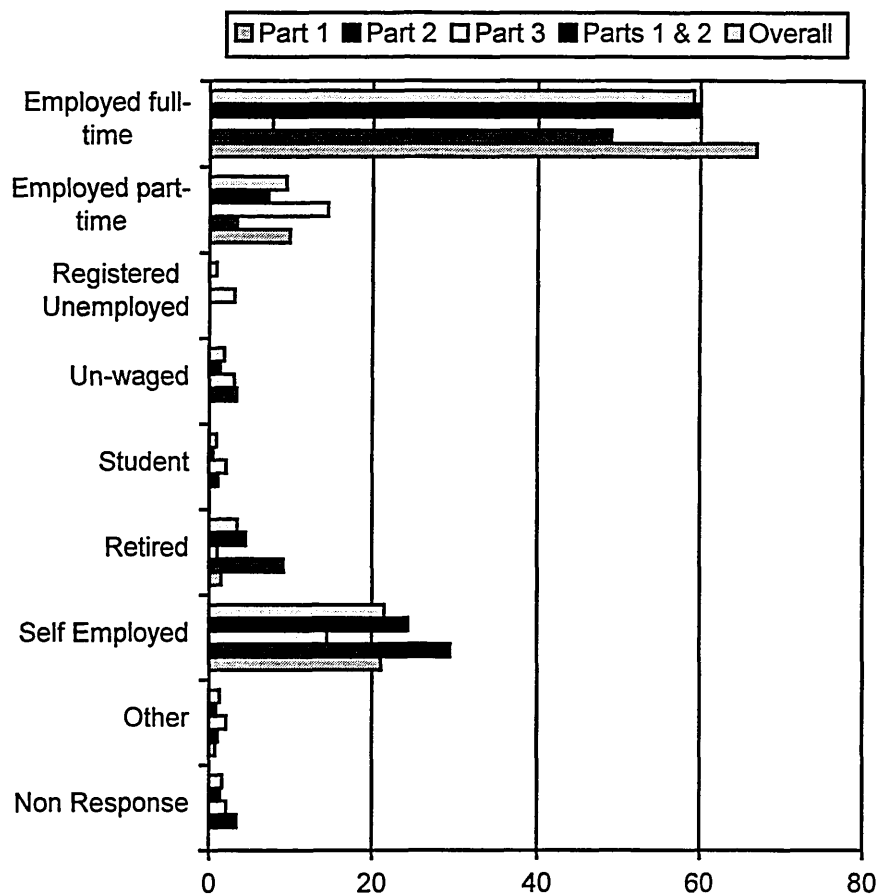
1) Sex of respondents:



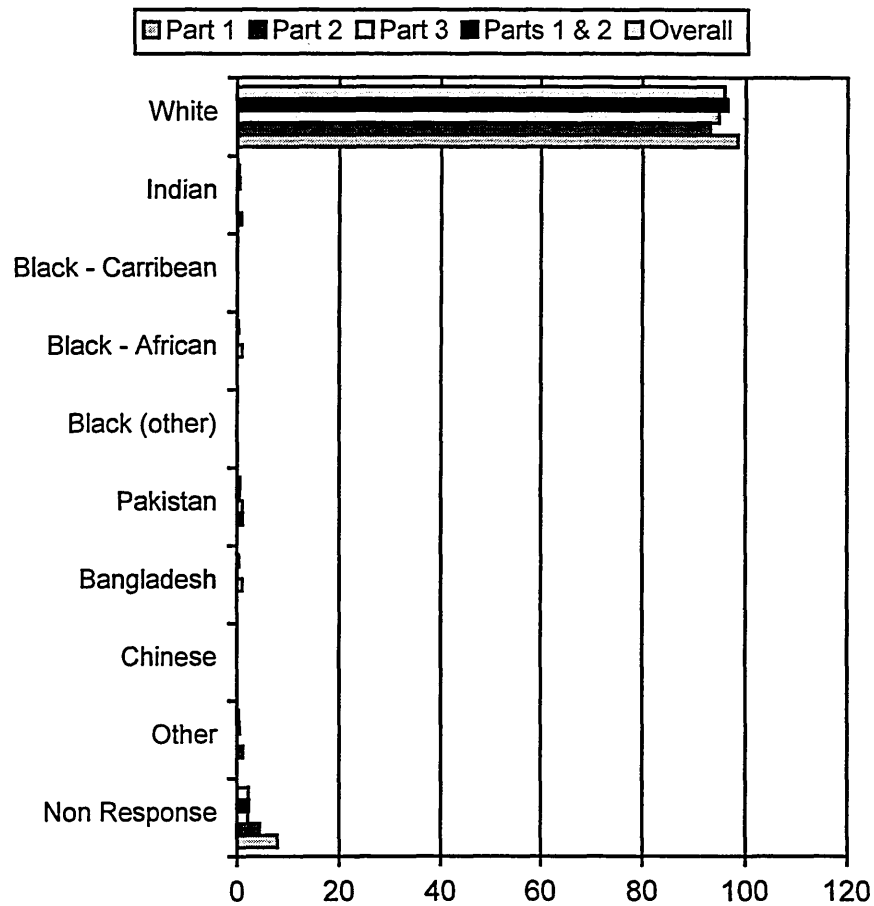
2) What age group are you in?



3) What is your employment status?



4) Which ethnic group do you consider yourself to be part of?



Appendix 16 - Comments from question 8. (SYP, 1998)

Comments have where possible been types as written on the questionnaire. Spellings where possible have been corrected. Underlines have been used '_____', to indicate a word that could not be read.

This appendix contains the comments received about a respondent's cause for complaint.

Part 1

- Lack of co-operation with regard to execution of warrant despite previous appointment which may have resulted in potential disorder.
- Lack of available manpower to respond to the Aniza (?) _____. Local police only.
- How the police seem to keep fobbing me off. A recent example. A _____ was broken into on 14\10\98. I have rung the crime desk for a crime number several times and I still haven't had one given. The excuse is that no paperwork was being passed through. This is one of several other times they have happened.
- Issues connected with the theft of a pickup truck and garden ornaments been stolen.
- After burglary uniformed officers were reluctant to pursue a line of enquiry relating to possible suspects. I had very good reason to suspect 2 people but my feelings were ignored.
- Not remaining on premises and relaying information to me when I attended a call out by the police at my school where I am caretaker.
- As a licensee I find the licensing department has no real control whatsoever. (It) is in fact incompetent and is only concerned with posturing in front of the magistrates and imposing petty rules on the few law-abiding licensees driving them to break the law.
- Complaint not made, however, staff are very concerned about lack of clear up rate of petty crime around the general area.
- We have trouble daily with the Asian community and nothing is ever done. (ie broken windows, vandalism etc.)
- General apathy towards crime. Lack of willingness by duty sergeant to prosecute a thief.
- We are subject to _____ attack by thieves. The SYP have done little or nothing to help reduce / control these. We have a red line phone alarm SYP team but by the time SYP arrive the thieves have gone. We have been forced to employ a private security firm and matters have now improved.
- Com. police. Had to get another area other than the one we live in to come and settle issue.
- Only in their ability to respond immediately to our needs when we had 3 burglaries within a week.

- I strongly feel that your alarm response policy is inadequate. We should not be penalised for an activation caused by a genuine break in.
- Responding to incidents. Action over incidents.
- Communication to each officer falls well short of an acceptable level.
- In relations to shoplifting and groups of youths. We need more help in urban areas. We seem to be soft targets.
- Time to arrive at incidents after numerous calls.
- Cars driving on the pavement past the premises far too close to entrance. This is a pedestrian precinct.
- We are still awaiting a visit from someone giving advice on further security since beginning of August. We have had a couple of phone calls advising that the person concerned is away \ on a course. We are still waiting ...

Parts 2 & 3

Parts 2 and 3 of the survey were carried out at the same time and therefore the comments are all mixed together.

- We reported a break in approximately 6 weeks ago, we have had no follow up call to say how things are progressing.
- In my job as school site manager I sometimes ask for police presence on site to deal with trespassers. The local PC is helpful but sometimes non-local constables seem reluctant to attend. I understand your powers are limited to the laws on trespass.
- Time between uniform and CID arriving was around 1 week. Scene of crimes officer had been but CID didn't even know!
- Delay in attending scene of crime due to address details correctly given, not being relayed to officers.
- A personal situation that caused me a great deal of grief and humiliation and because the police involved were out to convict me, even though I am totally innocent, they, the police were not at all interested in any of the mitigating circumstances. Too naive as then to make any complaint.
- Apparent lack of investigation. Scene not visited.
- I have a neighbour who is of senior age, whereby she committed criminal damage to my property, the evidence was there yet the police would do nothing! I'm disgusted.
- Not responding to remove poachers. Not responding to calls about drugs. Being used by people in cars close to my house, basically poor response in general. If you complain they will not respond at all in the future.
- They have not contacted me as to the break in or if any items recovered.

-
- 1) Difficulty in contacting crime desk. 2) No reply when message left on answer machine at sub station (Stanningley).
 - Giving a statement on behalf of a company and receiving crime no. at my home address.
 - 1) Don't see enough police on the streets to prevent crime. 2) In this particular incident, whilst investigating the suspect vehicle the alleged offendant was left in the drivers seat, enabling them just to drive off when the officer discovered stolen goods in the boot.
 - After burglary, kept in dark, no one let us know for 3 weeks, what was happening, nor afterwards.
 - The police brought my son home saying he put two fingers up to them, but in the meantime car thieves was running around the estate.
 - When small incidents of theft occur it appears its not worth reporting because it will not be investigated.
 - When telephoning Sheffield there is always a delay. After being put through to Doncaster there is a further delay.
 - SOCO was rude. Should be place on a course dealing with customer care.
 - Burglary - The burglars were in the house when I rang - waited and waited. After another 999 call took over 30 mins for a 5 minute drive. No follow up.
 - It took a long time for an officer to arrive. It also took a long time for the phone to be answered and also I required a crime reference number for insurance claim which took me over a week to receive.
 - Relating to comments made about the number of shop liftings we were reporting and that it was taking up too much of the police time and was fed up of visiting my store.
 - Been kept informed of any progress.
 - Too trivial for them to deal with, and was made to feel a nuisance.
 - Broken back window of my car, took two hours to arrive at the incident, obvious who had done the breakage, police seemed disinterested. It seems as long as you have a crime no. there's no problem.
 - Any minor theft is treated very matter of fact and the police tell you there is nothing they can do. Most minor offences are brushed under the carpet. It is ridiculous that offenders not related to your case can confess to your burglary to get a shorter sentence!
 - When my scooter was stolen from the lock ups at Norfolk Park Student Village, no officer came to consult with the security staff or look at the security tapes or question the witness.
 - The obvious indications that all police officers are only interested in the easiest option and are not interested in _____ policing.
 - Over manned at RTA and fires etc. Under manned at run of the mill incidents.
 - Saying they would visit and never arriving.
 - The time is took to investigate a theft.
 - Even when we have caught the shoplifters they haven't followed up and have let them go.
-

- Response time.

Appendix 17 - Comments from question 15. (SYP, 1998)

Comments have where possible been types as written on the questionnaire. Spellings where possible have been corrected. Underlines have been used '_____', to indicate a word that could not be read.

This appendix contains any other comments that a respondent chose to make.

Part 1

- There is some racial discrimination among police force that should be stopped.
- The police force (not motorway) lack the _____ that they used to have. It is impossible for the police to stop or slow down crime without the necessary deterrent of punishment and manpower.
- In general my dealings with SYP have been satisfactory on each occasion. On each occasion they have been helpful and friendly. However, the disappointing aspect has been on each occasion the crime remained unsolved.
- The incident in question was when I was w/end manager at Royal ___ Doncaster APC Aug '98. We had a suspected break-in. The overall police response service and follow up action taken was excellent. All the representatives who attended from Doncaster police station provided excellent \ professional and friendly service.
- I would like to see more police men walking the streets.
- Police force should be better funded. Closing area stations at night is a very poor idea, people feel they have no contact in an emergency.
- Up to now I have no bad comments to make about SYP. They have always been very helpful and quick to respond to our phone calls, being in this job we rely on SYP for our safety.
- The only area of complaint was the answering of the telephone at the local station, where the response was very slow.
- I consider SYP to be extremely courteous and helpful each time I have been in need of their services.
- Attitude when stopped for minor motoring offences - ARROGANT.
- I have great sympathy with the police. In my opinion they are fighting a losing battle. Everyday they are chasing justice on behalf of the public by getting criminals convicted, only for the sentence's given out to make them and us to think why do we bother. There is no deterrent for criminals. Bring back the birch.
- Overall I am pleased with the service, help and response from SYP. With regard to Q4, I have no idea what your _____ measurement is. Should they receive 5% or should they

receive 10%. If 8.5% is accepted ____ for a police force, I would say it is good value for money. But they need to keep reviewing in order to ensure they continue to provide this value.

- I would like to see more police on the beat, if possible. I would also like to see more community police working with the locals. And I think if police made more visits to local schools etc. it would give kids a more in depth view of police.
- Re. question 7. Following a fire at work I mentioned incident to CID who I believe made enquiries about burglary while investigating fire, as fire suspect and burglary suspect were the same person. I was happy with response from CID regarding this. Both incidents happened over a year ago but I think I need to mention given this opportunity.
- Not enough staff resources to fulfil duties. Not enough power in the courts to deal with most offenders. "Education starts at home in the schools". The police seem to pick up the pieces left!
- 1) More community police officers to tackle youth crime and work more closely with young children. 2) More commitment to stop crimes against peoples property, and a better follow up service.
- Officers appear to have a "what's the point in doing anything?" attitude. "We know who's doing it but we can't do anything about it!" It is resigned to its circumstances. Defeated!
- On the occasions where we have reported incidents to SYP we have always received a courteous and speedy response. They have been most helpful with advice, and follow up details of incident references, plus further contact at later dates informing us of the outcome of some of our reported incidents. Always a good informative service.
- My main areas of concern are the lack of positive results when sites like mine are being targeted and the police have local knowledge of culprits but fail to prevent re-occurrence. Greater use of targeting specific crime categories.
- 1) In addition to neighbourhood watch which some residents are in fear of due to reprisals from local youths - why not recruit 'Specials' from the same neighbourhood - Responsible people who want to help put their homes and those of their neighbours in a 'safe' environment. 2) Push councils to offer out of school activity centres for the bored youths who haunt the streets looking for unlawful activities.
- I would like to have been informed about the outcome of the case and not had to find out myself.
- Lack of prosecutions especially by young offenders by the C.P.S. breeds apathy amongst the police I feel. You can only bang your head against a brick wall for so long.
- We would like more doing about the Asian community - ie vandalism, broken windows.
- SYP officers seem to think they are doing people a favour by wearing the uniform. I think people have little respect for police officers these days. Basically because police officers

don't earn it. Police officers are not deemed as the role models they once were. I think this fails society.

- In my experience two officers usually work together - while one deals with my problems , the other is at a loose end. If a statement is taken and written up by one person, there is no need for another in that situation.
- Community police - rarely seen on streets other than in police cars.
- Community policing very effective at officer level. Do they really get the backing they need to address issues which they become aware of. eg special \ frequent visits by other colleagues to a particular site of concern, eg trespass etc., disturbance by groups on streets.
- More beat bobbies.
- Re. shop lifting \ theft - We could do with monthly visits from police with "mug shots" of known local shop thieves to help us protect our stock and recognise active shop lifters etc. and alert police if they are seen in the area.
- The incident in which I was involved with, I found the police to be very supportive, understanding and caring. They checked if we were fine and double checked if we needed further assistance. They were very obliging and re-assuring.
- Only that we need more PC and WPC because there is not sufficient to cover so large an area.
- More visibility on the streets.
- I am very satisfied with the liaison I have had with the police in the 'neighbourhood watch'. They have been very helpful indeed. In fact I have come to think of them as 'ordinary or normal' people!
- Not enough police in the force to cover crime in our area. Drug abuse is rising. This should be considered to be important as it has massive repercussions ie burglary.
- We have been broken into many times. The SYP are very friendly but do not communicate to other officers the problems we are facing. Face to face they are excellent they all go away and say they will report back to us what action they are going to take. 5 months later we are still waiting.
- To treat the victim of the crime no matter how small with a sensitive and re-assuring manner. Things that are probably familiar happenings to the police are very upsetting and unique to the public. Off hand treatment does not help/
- During the 21 months up to date, I have been licensee of the Grennel Mower Public House, 104 Lowedges Road, the police have been A1 in every possible way.
- I would like to see more police patrols after dark, in Clifton Park where I work 90% of break ins and vandalism occur during this period. The cost of the damage each year can run into thousands of £s.

- One instance where I needed assistance from SYP I waited for ages for them to arrive. when they finally arrived they explained that it was due to the night shift being over stretched. They told me the two of them were covering a very large area and was already answering another call.
- 1) The investment in management systems to release officer's time for community policing ie increase police visibility! 2) (For our own needs) Allow much greater flexibility in judging the removal of police response to a series of false alarms.
- After I had my wallet stolen from my office at work - I have not yet received information regarding the outcome of the case ie result in court etc. I have also not received a reply to my compensation claim. Will these 2 issues be carried out in due course?
- In the past it has taken that long to get through to the police for break ins and car theft my family has just not bothered to ring, and I am sure others are the same. No wonder certain crimes recorded are down. The problem has been too much waiting in the phone.
- Need to do more about shoplifters.
- I would like to see more police presence and more follow up after the event eg If anyone was charged. Also ideas on crime prevention.
- On one occasion I was stopped for a routine check one night coming back from my daughters in Mooreds after babysitting whilst she was at work, the time was 11.20pm. I had taxed my car that day and put the disc on the top of the dash, the policeman asked where it was, after I showed him the disc he was very rude saying (his exact words) I don't know whether to bollock you or book you, don't do it again. Unfortunately I didn't get his number.
- I've tried no one listens.
- I would just like to comment that I have been delighted with every aspect of our dealings with SYP. My dealings have been in connection with burglaries at work and also help in locating two lost foreign schoolgirls after a football match. I am very satisfied that S. Yorks. has a professional force of which we can be proud.

Parts 2 & 3

Parts 2 and 3 of the survey were carried out at the same time and therefore the comments are all mixed together.

- There should be more police per area. I think there is only four police (local) from Hoyland Common down through to Ward Green[?], which covers a large area. There ought to be more money available.
- SYP seem totally unable to do anything about vandalism in this area and seem unconcerned about it and the people in this particular area.

-
- Total lack of consideration after each break in or arrest of burglar.
 - As you can see Q13 [Image] caused me some dilemma. The PCs I deal with are mainly good, but I know that in general in the public eye SYP or police in other areas are not looked upon in a good light. I would like to see more respect given to police by the youth of today. Maybe more power to control them etc.
 - They need to be professional in their follow up. If they were a sales force following up contact customers they would be quicker, efficient and know what they are talking about. I feel that communication between departments was the worst point.
 - I personally feel that SYP have greatly undermined their own standing with the public by not putting more beat officers out on patrol. There is very little contact except in cases of distress.
 - Not really . How can one individual like me make a difference against "the establishment" who have the money, resources and trickery to make a difference. All the police want to do is protect themselves "earn" their stripes and to hell with the true victim.
 - With limited resources I think they do a pretty good job overall.
 - Telephone takes too long to be answered. Messages are not passed on. Too long winded to get to speak to person you need. Our community policeman is excellent (PC Peter Booth).
 - I was a PC in SYP (1972-74) and can compare relative services, responses etc. I can also appreciate today's changes public attitude towards SYP. Also the increased workload etc. I believe that there is a great loss of faith in the ability of the SYP to deal with most problems.
 - Poor telephone service!! If you phone up to inform them of a problem you inevitably get a long wait and music, neither of which you want. Lack of staff and resources or we are very busy are always quoted. This is a service that should give a service and not excuses!
 - After having motorcycle stolen and outhouse broken into, no one came to see me or the scene even though I informed the police the thieves had left tools they used behind. Surely some help there? I even had to chase up a crime number myself.
 - We have had several incidents where a burglary occurred at the shift change ie 9.50pm and the earliest the police arrived on site was 10.20pm. If I know the police work a set shift pattern ie 6am, 2pm, 10pm then surely criminals do.
 - Give them more powers, I'm sure they have got public support. and finally get shut of dogooders they keep crimes, druggies and all the other low life scum on the street.
 - I believe and so do many of my friends and relations that the police helicopter is used far too many non emergency call outs at a great cost to the tax payer. And more police on the beat especially in the Thorne area.
 - When people are prepared to put their reputation and sometimes their lives at risk to help the police, then in return it would be nice to know if the info had been useful / are we wasting police time attitude sometimes gives the public, the awareness that they may be just doing
-

the latter. A bit of confidence in the public would be nice. A little bit of feedback does comfort.

- Recently the alarm went off at work. I am the key holder. When I arrived at the premises, a burglary had taken place. The police were already there and the dog handler was on his way. The service from that point was superb, even returning, officers kept up surveillance whilst I waited for boarding up etc. They were very helpful and extremely caring. Thank you.
- My dealings with South Yorkshire Police have always been pleasant and effective. I have friends in other areas of the country who do not seem to have the same experiences. I feel SYP are superior to some other forces.
- The only comment I have is they are obviously undermanned. I live in a village. their work load and service would be improved with more funding for wages.
- I think the police patrols \ presence \ coverage is poor. No doubt because of the level of funding. This is reflected in poor response times and all other poor markings I have given. I do not understand why reported incidents are handled by several officers who appear not to communicate fully causing delays and confusion.
- the criminals knew my mother was in hospital. Why don't the police keep an eye on estates a bit better.
- Too much emphasis on motoring \ traffic offences. I do not drive, but it is still obvious to anyone. Ministry of Transport should be responsible for all traffic violations, freeing the police force to concentrate on burglary, theft and violence.
- Lack of police on the beat. Crimes not pursued to ground allegedly due to shortage of manpower. Also penalties by government not severe enough which undermines police authority for which I have sympathy for all police forces.
- In my recent experience while most aspects of the matter were dealt with superbly I was shocked to find that I had to pass information between the officers of West Bar Green who dealt with the original burglary and officers of Ecclesfield who found some of the stolen items and made arrests. The SYP system failed to do this. The investigation co-ordination was very poor.
- The police were polite, friendly etc. No complaints at all about this. It is simply the feeling that you are going through the motions of filling in paperwork etc. We have no follow up except for a standard letter, so we have no idea whether any investigation takes place or not. A knife was found on our premises with prints on it? We were not informed whether anything has come of this. you are left with the impression that yours is another in a long series of burglaries which the police know they have no chance of solving - a series of helplessness, and that it will inevitably happen again.
- I think there should be more police officers patrolling the streets, getting to know the public better, knocking on doors and asking how people are etc. Also they could give us advice on

crime prevention and keep us up to data with what's happening in our area: example The Police Helicopter.

- Have more community police in country areas.
- Having to phone Sheffield before being diverted back to Barnsley. Length of time and lack of manpower. Not enough police actually on the beat.
- The recent break in of my garage was dealt with entirely by telephone. I would have preferred a face to face conversation as a telephone conversation seems rather impersonal.
- The main problems I have with SYP is time getting a response to phoning as you go through too many switch boards. Also they don't take notes to start with and ask you to repeat it all. Their initial response is too long as they might take over 30 mins for things you want straight away eg Arresting a shoplifter. As we are not safe holding one for this length of time and they get rid of the evidence.
- My only disappointment with SYP is of failure to catch the thieves who broke into my garage. As over the last few months, houses and garages etc have been broken into regular early morning in our area and I think more could be done to catch them.
- Through work experience when police contracted they seem uninterested in matters that the general public are concerned about. ie vandalism to property \ cars \ amenity park areas. Comments like "Well we know where they are in there" leaving them to do as they like.
- The response from 999 could be improved. ie having to explain every single detail before being put through to the police.
- More police on the beat.
- Not satisfied with the policing at Penistone during the night as it takes 20 minutes for police to come from Wombwell as we've had experience of this during a break in at our house. Had someone being available at Penistone they could've caught the burglars in the act, but after 20 minutes when the police arrived the burglars were well gone.
- Reporting an incident of dangerous driving at Moss Way police station kept waiting for 40 minutes being made to feel that I was the culprit. Finally being told to forget about the incident as it was my word against the culprit.
- Although response in answering the telephone is immediate, it then falls down because of the times you are passed to different areas before speaking to the appropriate officer.
- SYP are polite, friendly and helpful, but as far as I am concerned have yet to actually catch anyone. I have had my shed broken into, car radios stolen, lawnmower stolen, my son beaten up and no goods retrieved or criminals apprehended. They are also invisible on a day to day basis ("on the beat").
- Only that funding could be increased and past on by use of more foot police during day and increase manpower covering slated areas during evenings and weekend.

-
- I think SYP should make more effort to integrate themselves in the community. In particular, known areas of high crime. By involving themselves in community groups \ schools etc. giving information and drugs \ alcohol \ effects of crime etc.
 - It appears if you do not have absolute proof against someone there is no chance they will ever be prosecuted and one persons word is never enough. Policing of traffic ie there appear to be few measures taken to deter speeding: exceeding speed limit or other dangerous driving. Use of mobile phones while in motion.
 - More police presence on the streets.
 - the officers cannot always arrest young teens 13-15. Parents should be made to pay for actions of their children.
 - We have had a repeat offence, the same piece of machinery being stolen, probably by the first offender who was convicted. Household and out building burglary continues to increase rapidly over the last 10-15 years. We now lose a lawnmower \ machinery every 6 months. More surveillance required together with tougher deterrents. This crime costs us considerable money in insurance premiums, lost time removing wheels from equipment to prevent theft etc. Unless the level of burglary \ petty theft is reduced I will leave South Yorks. There is no point working hard when the proceeds are taken from you.
 - In the case of a burglary which has happened to me twice, it would be nice if the police kept you more informed and not _____ one phone call to say sorry your file has been shelved.
 - I don't like the Sheffield phone service. I would prefer local numbers, local bobbies at local stations. I am confident that it would result in quicker response times and all in all a better service.
 - Better service.
 - No follow up from the SYP at all on the break in \ burglary.
 - In the past 6 years we have been burgled 3 times, the car has been broken into twice and stolen once (£6,000+ damage). SYP have been polite and punctual but no criminal has been caught or goods returned (Except car). It's lucky we're well insured.
 - Any dealings I have had with the police have always been good. they have been friendly, polite and as helpful as possible, no complaints as yet.
 - When our dog was a puppy he ran away a lot when the gate was left open. The SYP were more than helpful and friendly in helping us to find him. One officer even brought him back to our door on a piece of rope late one night. That was lovely.
 - I think there should be more police on the beat, if not on the beat should be seen to be driving around our estates especially at night. Also a smile and a chat to small children would not go amiss when they meet on the beat. Lets go back to real policing and zero tolerance.
-

- Living in an area that consists mainly (60%) elderly people I personally would like to see a local community policeman now and then. These people are regular targets for burglaries and muggings.
- Because the break in was into my garage (private) the police did not attend, at the station they took my details of what was stolen, gave me a crime _____ number and told me to claim on my insurance.
- Generally I am very impressed with the service I have experienced with SYP.
- I consider the police hands are tied in most respects, and I think they should be given more power.
- Local burglary and small time theft is not taken seriously enough. Probably insurance will cover loss but it cannot compensate for violation of personal belongs and life. An old person can lose the will to live just because of small time burglary - it stinks!!!!!! I personally as a 42 year old suffered depression.
- I think the police helicopter is a very positive move and feel that it heightens the police presence through the city and suburbs.
- Crime is crime no matter how small or large the offence. It seems that if an officer has the slightest doubt as to the proof of a crime then no action is taken.
- More foot patrols.
- We have had several incidents concerning shop liting and attempted bream ins. Not one of the crimes has been brought to justice.
- They did a very good job for us when burglars broke into our garage.
- I would like to see more police patrols around my business. Very few check any shop premises.

Appendix 18 - Tables and Figures from Chapter 6

Table 1 - Factor Analysis

	Factor 1	Factor 2	Factor 3
q1	0.85533	0.27383	0.16423
q2	0.76637	0.27495	-0.05688
q3	0.73702	0.41169	0.13751
q4	0.84734	0.24942	0.15423
q5	0.69340	0.06206	0.21219
q6	0.26308	0.18633	0.80957
q7	0.09079	0.15384	0.89061
q8	0.17365	0.92513	0.14468
q9	0.43366	0.75847	0.22633
q10	0.47197	0.65321	0.20513
q12	0.77467	0.39150	0.23183
q20	0.67822	0.23952	0.29886

VARIMAX converged in 5 iterations.

Figure 1 - The ACSI model

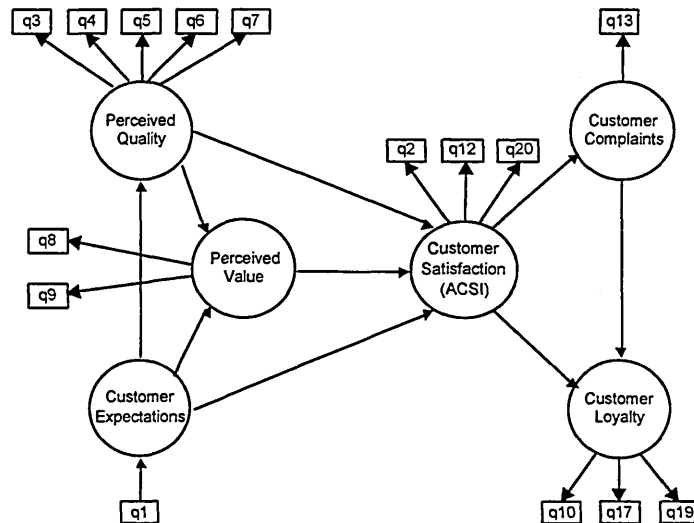


Figure 2 - The Sheffield Model

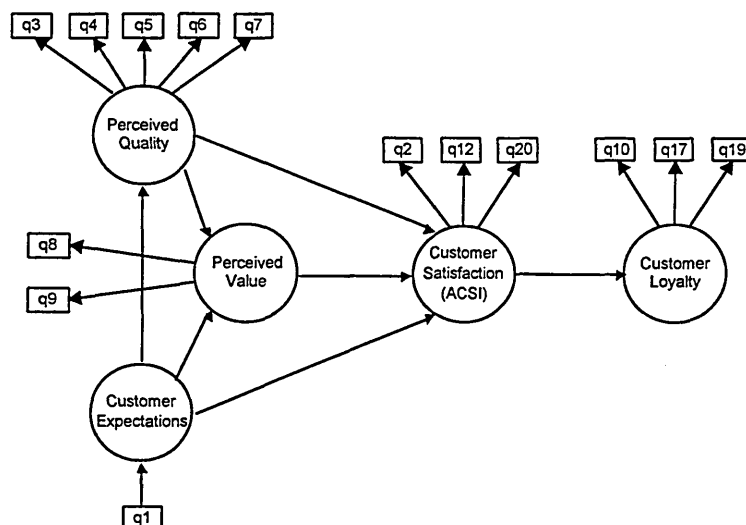


Table 2 - Comparison of Index results

Dimension (calculated by PLS)	ACSI Model	Sheffield Model	Difference
Expectations	76.0	76.0	0
Quality	81.7	81.7	0
Value	75.5	75.5	0
Customer Satisfaction	75.0	74.9	0.1
Complaints	70.8	N \ A	N \ A
Loyalty	74.8	74.7	0.1

Figure 4 - ACSI Model Path Diagram

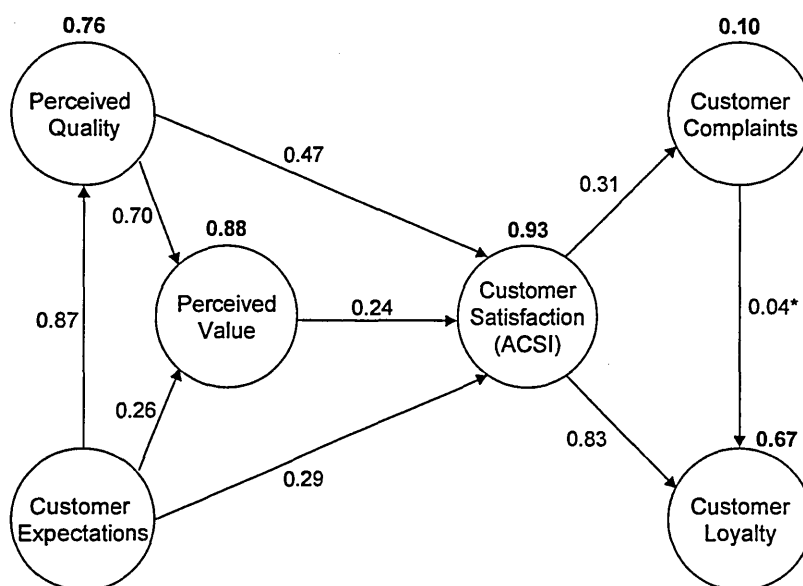
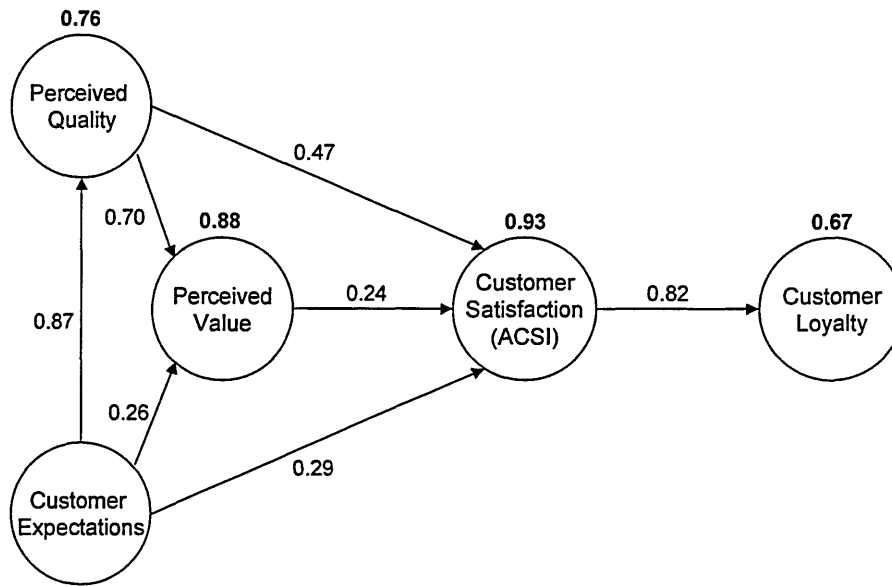
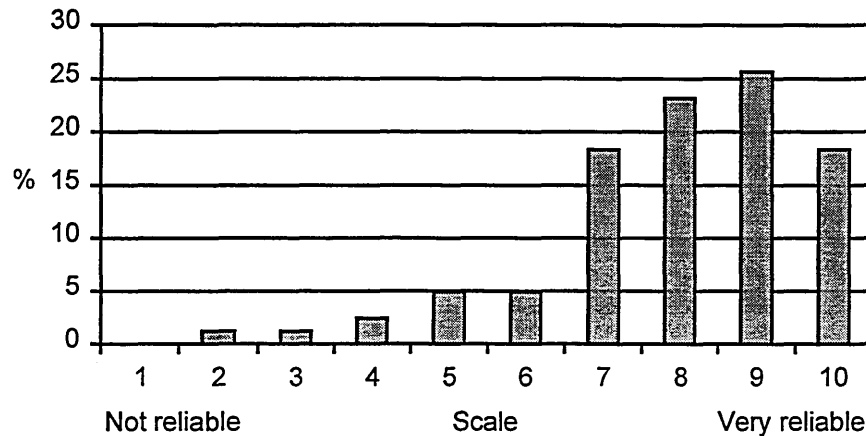


Figure 3 - Sheffield Model Path Diagram

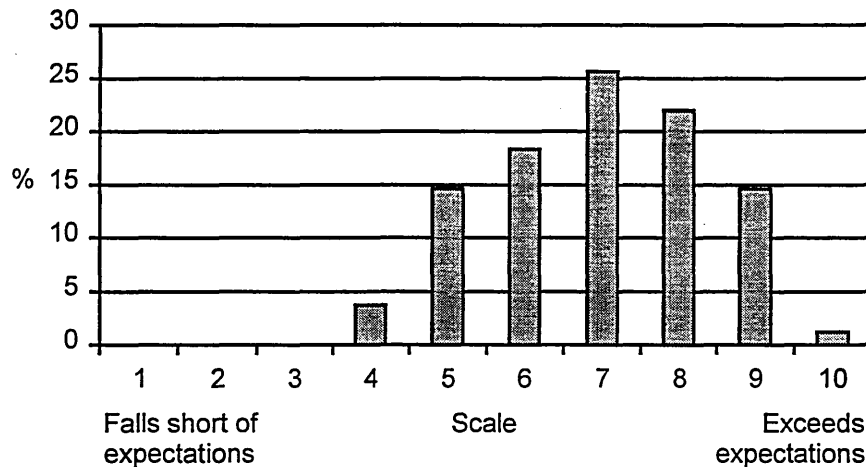
Appendix 19 - Results by question (YPO)

In this appendix is a graphical representation of the results from each question.

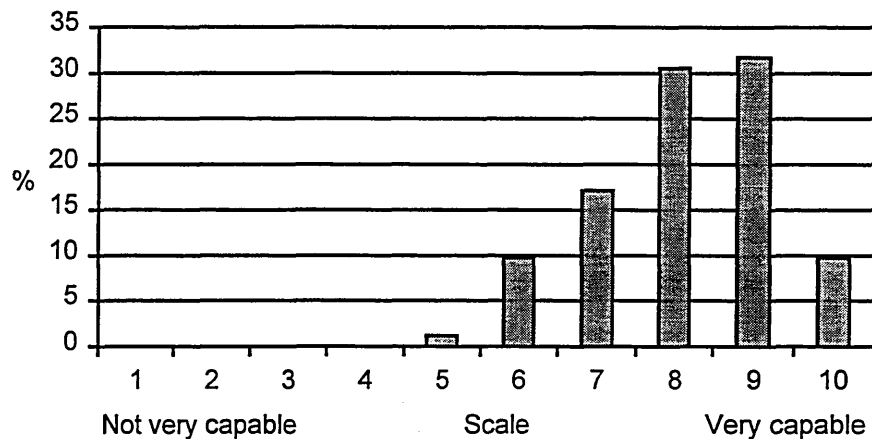
- Question 1)** - From your past experience of YPO, how reliable would you say they are in terms of delivery and service? Using a ten-point scale where 1 means 'not reliable' and 10 means 'very reliable', please circle the number that best indicates your feeling of YPO's reliability.



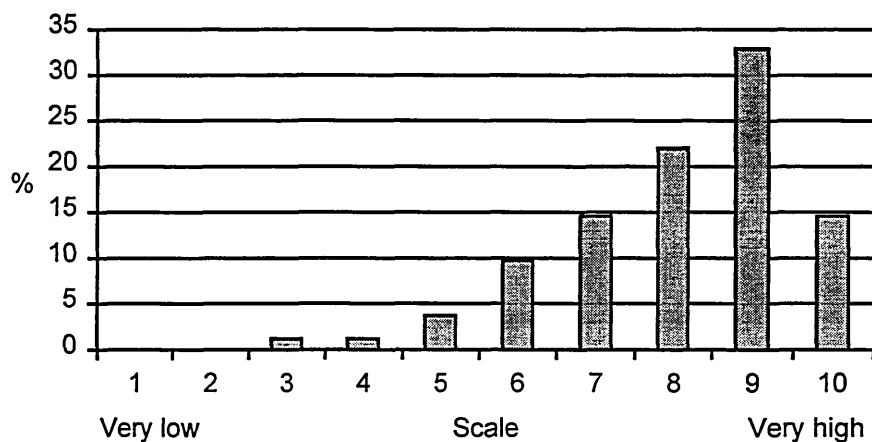
- Question 2)** - In relation to the products and services that you receive from YPO, to what extent have they fallen short of, or, exceeded your expectations?



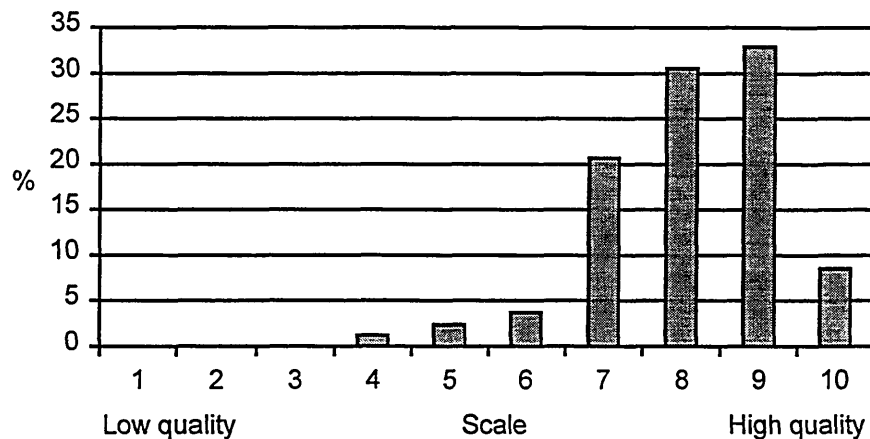
- Question 3)** - How capable would you say that the staff of YPO are, in terms of the job they are required to do? (Please think in terms of delivery performance and the ability of YPO staff to deal with your problems.)



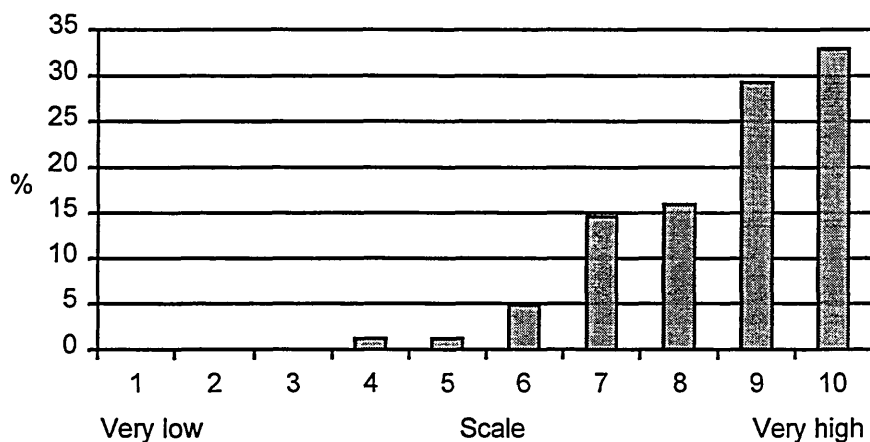
- Question 4)** - Please think about the overall quality of service (not goods) that you receive from YPO. How would you rate their quality of service?



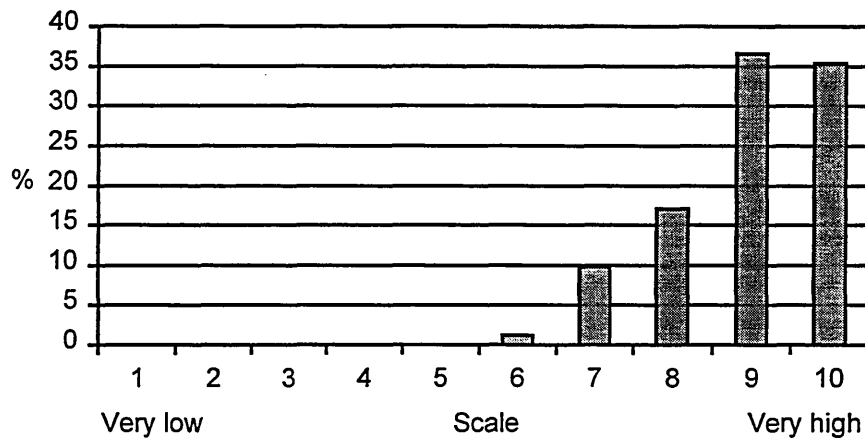
- Question 5)** - Now please think back about the products that you receive from YPO, in general how would you rate the quality of the merchandise that you purchase?



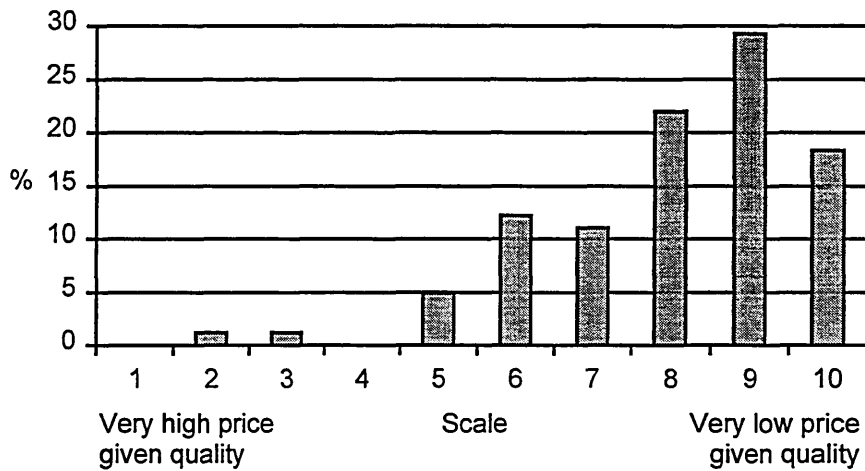
- Question 6)** - How important to you is quality in relation to the service (not goods) provided by YPO?



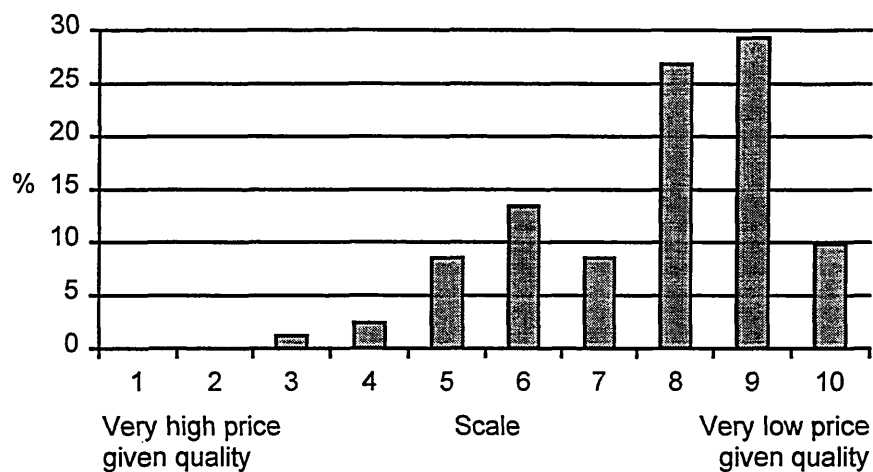
Question 7) - How important to you is quality in relation to the goods (not services) provided by YPO?



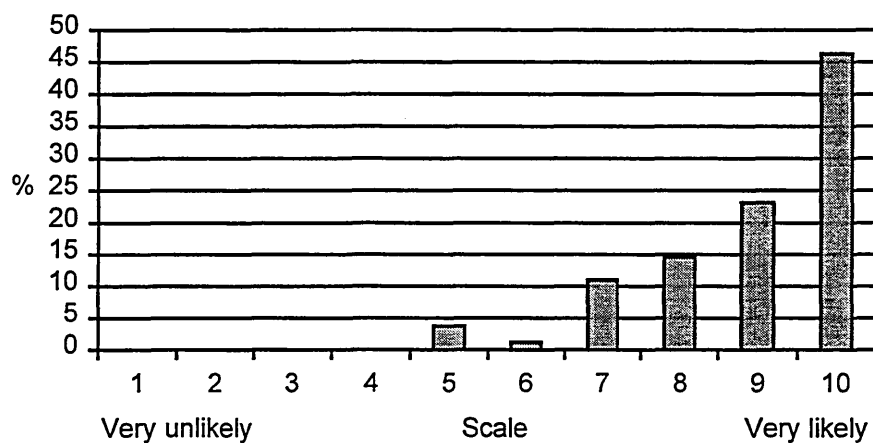
Question 8) - If you were to compare YPO against other suppliers of similar goods, how would you rate the price you pay for goods (not service)?



- Question 9)** - If you were to compare YPO against other suppliers of similar goods, how would you rate the price you pay for goods (not service)?



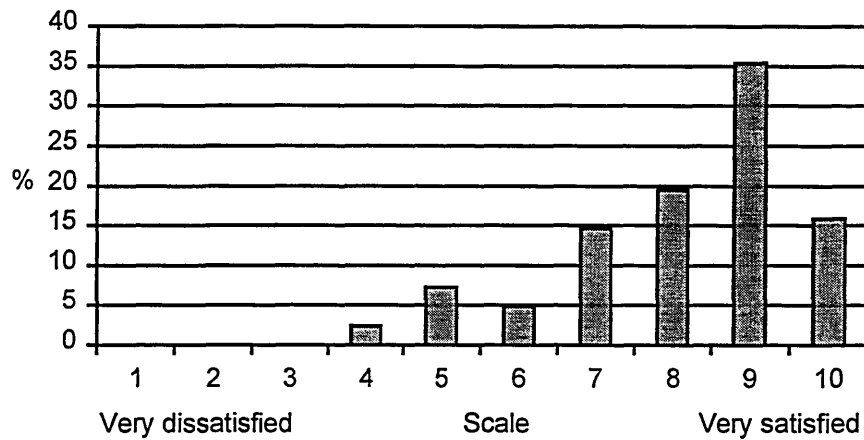
- Question 10)** - The next time you require products that are available from the YPO catalogue, how likely is it that you will buy from YPO?



- Question 11)** - Are YPO the main supplier of goods to your school?

Yes	93.9%
No	6.1%

Question 12) - Please consider all your experiences up to date with YPO. How satisfied are you with the overall service provided by YPO?



Question 13) - During the last year, how many times (if any) have you been less than satisfied with YPO services?

Percentage of people who had never been less than satisfied with YPO - 74.4%

Percentage of people who had been less than satisfied with YPO - 25.6%

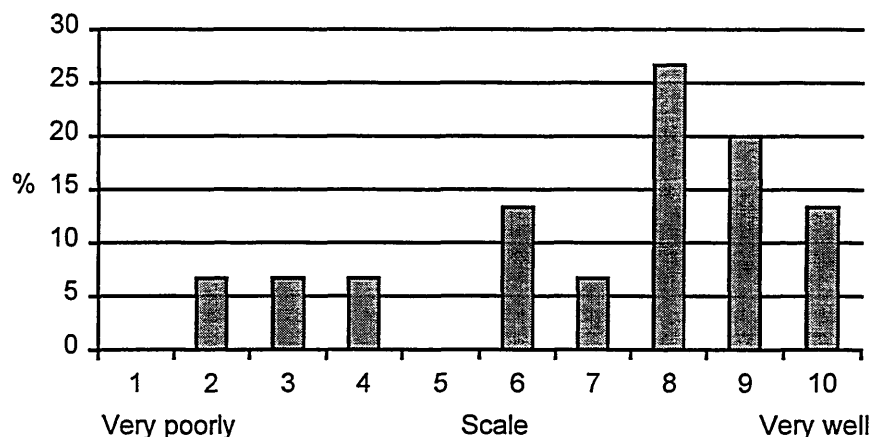
Question 14) - Broadly, what were these issues about?

See appendix 20 for a breakdown of the responses.

Question 15) - During the last year, if you have been less than satisfied with YPO have you raised this as an issue with YPO?

Yes	15
No	5

- If yes, how would you rate the way in which the complaint was handled?



The graph above is calculated as a percentage of the number who indicated that they had complained.

The results for questions 16) - 19) inclusive, are displayed in the format of yes / no. Please note, the response rates for questions 16) - 19) were fairly low.

Question 16) - In the last year, how many times have you received service from YPO with which you have been pleased? (If none (0), go to question 18).

% of people who did not indicate how many times they had received service with which they had been pleased - 31.7%

% of people who indicated that they had received a service with which they had been pleased - 68.3%

Question 17) - When you have had an experience that has pleased you, with how many people have you discussed it?

% of people who had discussed a positive experience with someone - 35.4%

% of people who had not discussed it with anyone - 64.6%

Question 18) - In the last year, how many times have you received service from YPO which has upset you? (If none (0), go to question 20).

% of people who did not indicate whether or not they had received service with which they had been displeased - 93.9%

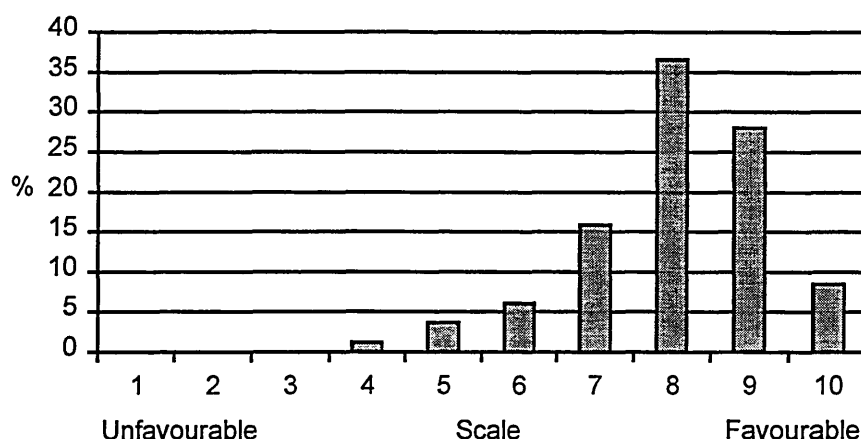
% of people who indicated that they had received a service with which they had been upset - 6.1%

Question 19) - When you have had an experience that has upset you, with how many people have you discussed it?

% of people who had discussed a negative experience with someone - 4.9%

% of people who had not discussed it with anyone - 95.1%

Question 20) - If you can imagine an ideal catalogue company for the supplies that you purchase, how well do you think YPO compares with this ideal company?



Question 21) - Are there any areas or issues connected with the YPO that you would like to make further comments about?

For a full listing of the comments that were made please see appendix 21.

Personal Details

Position of person completing questionnaire.

	%
Head Teacher	41
Acting Head Teacher	4
Administration Officer	17
Secretary	15
School Assistant	9
Bursar	1
Financial Secretary	2
Clerical Assistant	1
Deputy Head	1
School Clerical	2
Budget Secretary	1
Non Response	5

Number of orders placed per year

Approximate number of orders placed with YPO each year.

The mean average is 31.9 orders.

Appendix 20 - Comments from Q14. (YPO)

Below can be seen a list of the comments that were made in response to question 14) which asked the respondent to briefly describe why they had been less than satisfied with YPO.

- Poor layout of certain goods in catalogue. Incorrect goods sent in error.
- Unavailability of ordered goods resulting in long and unadvised waiting.
- Goods not available in stock. Delay in communication i.e. ringing back.
- Goods not available.
- Quality of writing pencils.
- Slow delivery of goods.
- Delivery time too long.
- Toys e.g. doll that fell apart.
- Wrong item delivered.
- Damaged goods. Wrong goods supplied.
- Wrongly identified goods in cartridges. Poor quality. Deliveries left at front door. Less choice.
- Late deliveries. Incomplete orders (To Follow!!).
- Delivery times (over 10 days). Missing items - better as.
- Damaged goods - took nearly a month to replace.
- Long delivery wait on filing cabinets.
- Goods we have used for years discontinued. Deliveries taking too long.
- Lost one sheet of faxed order.
- Generally, long delivery delays.
- Missing item from delivery.
- Time of delivery. Having to wait 2/3 weeks. Some goods not in stock.
- The length of time Metro Gym take to equipment. Quality of paper - flip chart, display etc.
The length of time some items take to arrive.

Appendix 21 - Comments from 21. (YPO)

Below can be seen a list of the comments that were made in response to question 21) which asked the respondent for any further comments.

- Catalogue items sometimes difficult to find due to obscure title e.g. self adhesive book covering film - Schools refer to this as 'tacky-back'.
- Left handed nib units have gone out of circulation making it difficult for us as we purchase most of our goods from YPO.
- I appreciate their excellent 'collect' service for emergency orders. I wish they could deliver on our route more frequently than once a fortnight. This is the only minus in my opinion.
- Occasionally we have to wait a while for delivery and occasionally items are out of stock. So far this has not caused a problem.
- Quicker turn around of orders. Speedier response from special departments e.g. furniture. Clearer procedure for picking up incorrect or returned products.
- Our only disappointment is with delivery. We would welcome a 'next day' or 'next week' service.
- Some goods are not available from YPO, although I note new items do appear from time to time.
- The service when placing orders is most satisfactory. The quality of goods are satisfactory. The delivery process seems to be slow.
- Telephone staff very pleasant and helpful.
- YPO delivery turnaround is appalling. Two weeks is far too long. It is often worth paying a pound or two more from a local company for next day delivery. We find we are doing this more and more.
- 10/10 to staff. They are always helpful and courteous. If there is a problem it has been dealt with quickly and efficiently.
- Having catalogue on SIMS disk makes administration of orders easier.
- Catalogue number to stay the same for longer periods.
- Quicker delivery after ordering.
- From ordering to delivery of goods delivery time is excessive, sometimes it can be 3 - 4 weeks.
- When ordering one or two items telephone ordering would be preferred.
- Inflexibility around ordering dates although I appreciate the difficulties.
- If the catalogue had more in it we would be able to use it more!
- I am very pleased at the speed in which goods are delivered.
- Having difficulties ordering items in an emergency.
- More frequent deliveries would be a distinct advantage.

- The only area of concern is that of goods ordered via YPO from other suppliers which have occasionally being delivered damaged.
- Delivery of goods a bit slow.
- It is very helpful that items on orders and invoices are in the same order. Questions 16) & 17), overall the quality of service received has been good and staff helpful.
- I find that delivery of goods does not seem to be as quick as it used to be, although I still think it is a good service.
- Stock items we use regularly have been discontinued. Doncaster art uses Prussian blue powder paint. Why have YPO stopped selling it? All Doncaster schools need it. (One example)
- Sometimes goods are needed urgently and it would be useful if an express delivery service was available.
- Delivery times could be more frequent.
- Sometimes I find it difficult relating to which catalogue number refers to which picture item in the catalogue. I think it could be done more clearly.
- I have been delighted at the improvement in service from YPO. In all orders placed recently, every item has been received on the first delivery.
- It would be helpful if there could be an express delivery service for urgent orders.
- Difficult to get small amounts of goods quickly delivered.
- The quality of some goods has deteriorated / varied. Recently the length of time some deliveries & Metro Gym take has been disappointing.

Appendix 22 - Tables and figures from Chapter 7

Table 1 - Age Groups

Age Group	Percent
Under 25 years	1.1
25 - 29 years	6.8
30 - 34 years	11.4
35 - 39 years	11.4
40 - 44 years	18.2
45 - 49 years	20.5
50 - 54 years	21.6
55 - 59 years	5.7
60 - 64 years	2.3
Over 65 years	1.1

Table 2 - Employment status

Employment Status	Percent
Academic	23.9
Public Sector	6.8
Business \ Industry	63.6
Other	5.7

Table 3 - Factor Analysis

Question	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q1	0.84987	0.12599	0.10078	-0.01929	0.06643
Q2a	0.08825	0.34688	0.78054	0.24368	0.15722
Q2b	0.13224	0.11728	0.89044	0.20242	0.08354
Q2c	0.07295	0.16703	0.88085	0.15351	-0.06288
Q2d	0.10310	0.02597	0.37337	0.86083	0.18893
Q2e	0.12827	0.24190	0.24096	0.9010	-0.00617
Q3	0.80611	0.06439	-0.11492	0.13317	0.07479
Q5a	0.20841	0.91829	0.14742	0.09740	0.06887
Q5b	0.25850	0.90590	0.13708	0.05922	0.13679
Q5c	0.30913	0.87455	0.16579	0.03710	0.22468
Q5d	0.56561	0.47393	0.21101	0.17709	-0.23087
Q5e	0.17063	0.63385	0.22700	0.15275	-0.30738
Q5f	0.84508	0.11395	0.06224	0.14349	0.07993
Q5g	0.89845	0.18501	0.05898	0.18678	-0.04045
Q5h	0.77251	0.25768	0.10525	-0.05760	0.12116
Q8	0.55108	0.14539	0.17594	0.04102	0.30475
Q14a	0.85263	0.15992	0.04672	0.01104	0.07284
Q14	0.79185	0.24223	0.05153	0.07611	0.01204
Q14c	0.21382	0.09098	0.09420	0.12967	0.85141
Q14d	0.84884	0.21195	0.09538	0.0921	-0.14460
Q15	0.89550	0.10378	0.15396	0.03630	0.02393

Varimax converged in 6 iterations.

Figure 1 - ACSI Model

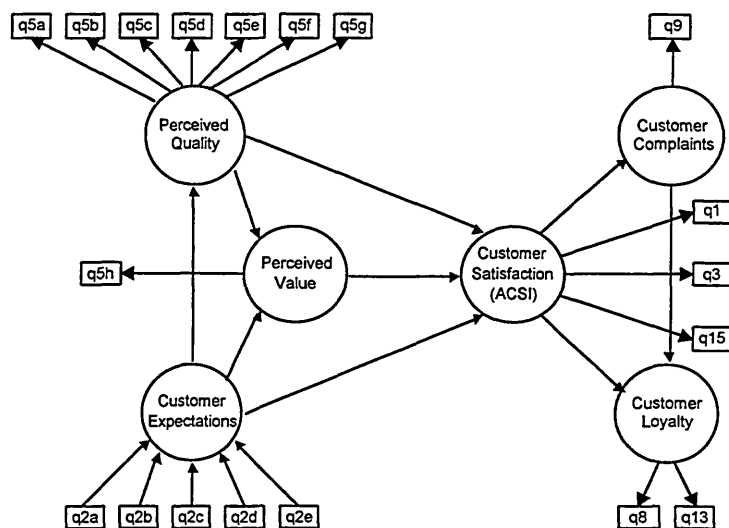


Figure 2 - Sheffield Model

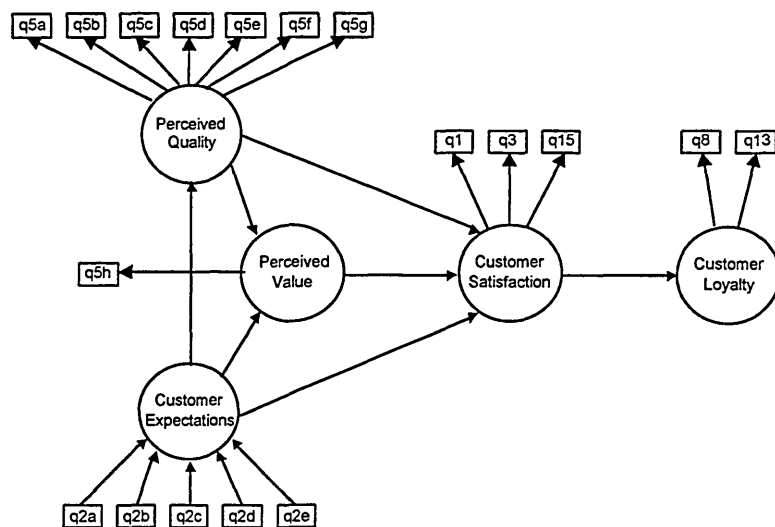


Figure 3 - ECSI Model

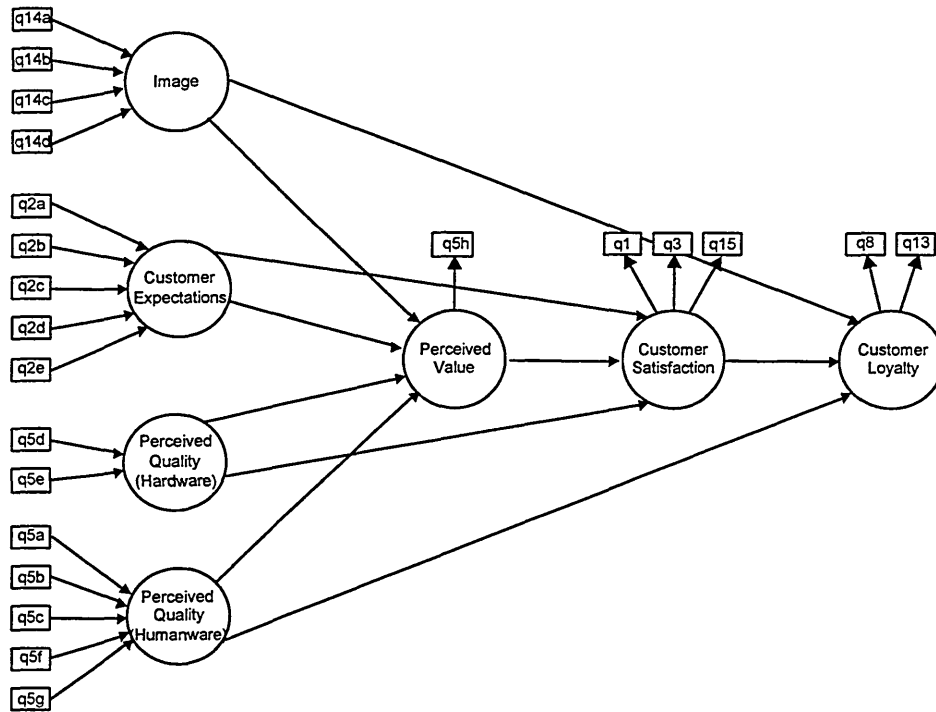


Table 4 - Comparisons of the different model results

Dimension	ACSI Model	Sheffield Model	ECSI Model
Perceived Quality (Human)	72.34	72.34	65.35
Perceived Quality (Hardware)			77.71
Customer Expectations	68.65	69.65	69.35
Image	N \ A	N \ A	68.81
Perceived Value	69.14	69.14	69.14
Customer Satisfaction	62.81	62.79	63.52
Complaints	83.33	N \ A	N \ A
Loyalty	59.12	59.12	59.12

Table 5 - Age Groups

Age Group	Percent
Under 25 years	1.6
25 - 29 years	16.1
30 - 34 years	3.2
35 - 39 years	17.7
40 - 44 years	17.7
45 - 49 years	16.1
50 - 54 years	17.7
55 - 59 years	4.8
60 - 64 years	1.6
Over 65 years	1.6

Table 6 - Employment status

Employment Status	Percent
Academic	35.5
Public Sector	14.5
Business \ Industry	48.4
Other	0

Table 7 - Factor Analysis

Question	Latent Variable	Factor					
		1	2	3	4	5	6
Q1	Satisfaction	0.804	0.115	0.421	0.018	0.051	-0.045
Q2a	Expectations	0.076	0.333	-0.321	0.477	0.365	0.372
Q2b	Expectations	-0.026	0.031	0.079	0.064	0.324	0.821
Q2c	Expectations	-0.021	0.026	0.029	0.044	0.918	0.262
Q2d	Expectations	0.105	0.029	0.030	0.884	-0.083	0.163
Q2e	Expectations	-0.108	0.036	-0.096	0.876	0.030	-0.088
Q3	Satisfaction	0.613	0.301	0.509	-0.072	0.082	-0.174
Q5a	Quality (h)	0.013	0.462	0.359	0.385	0.183	-0.215
Q5b	Quality (h)	0.304	0.687	0.203	0.185	0.075	-0.100
Q5c	Quality (h)	0.018	0.804	0.202	0.067	0.022	-0.029
Q5e	Quality (s)	0.855	0.098	0.031	0.064	-0.080	-0.090
Q5f	Quality (s)	0.878	0.060	0.196	0.011	0.170	-0.060
Q6a	Value	0.270	0.758	-0.071	-0.077	-0.046	0.180
Q6b	Value	0.865	0.278	0.094	-0.010	-0.013	0.125
Q6c	Value	0.927	0.154	0.033	0.029	-0.094	-0.032
Q7a	Image	0.503	0.480	0.326	0.029	-0.104	0.144
Q7b	Image	0.087	0.508	0.625	-0.044	0.228	0.118
Q7c	Image	0.557	0.385	0.020	0.127	-0.225	0.238
Q7d	Image	0.690	-0.040	0.380	-0.242	0.320	-0.097
Q8	Loyalty	0.507	0.097	0.660	0.130	-0.101	-0.135
Q13	Loyalty	0.702	0.252	0.570	-0.075	0.026	0.028
Q14	Loyalty	0.570	0.183	0.673	0.053	-0.055	0.138
Q15	Satisfaction	0.633	0.307	0.527	0.048	-0.077	0.157

Varimax converged in 43 iterations.

Figure 4 - ACSI model

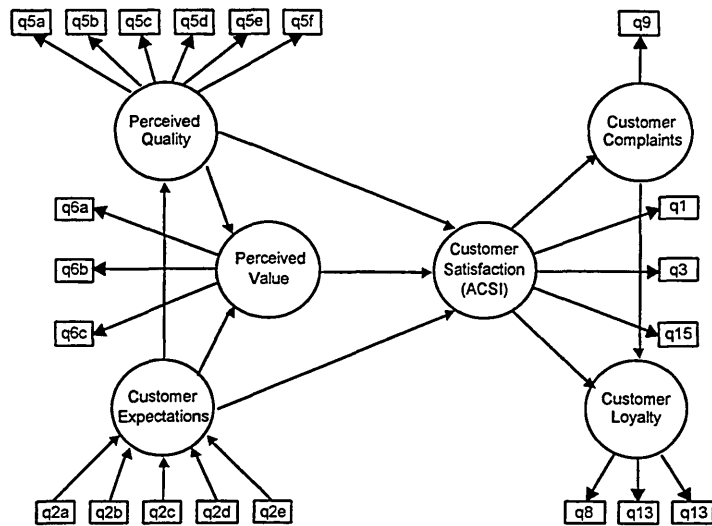


Figure 5 - Sheffield Model

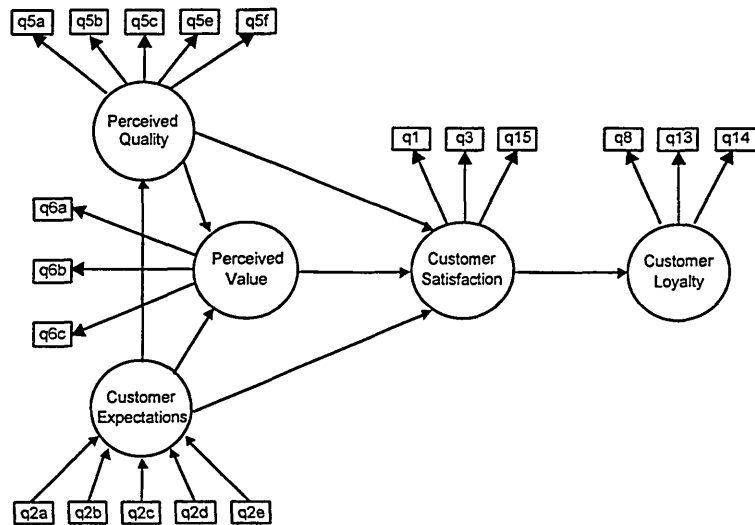
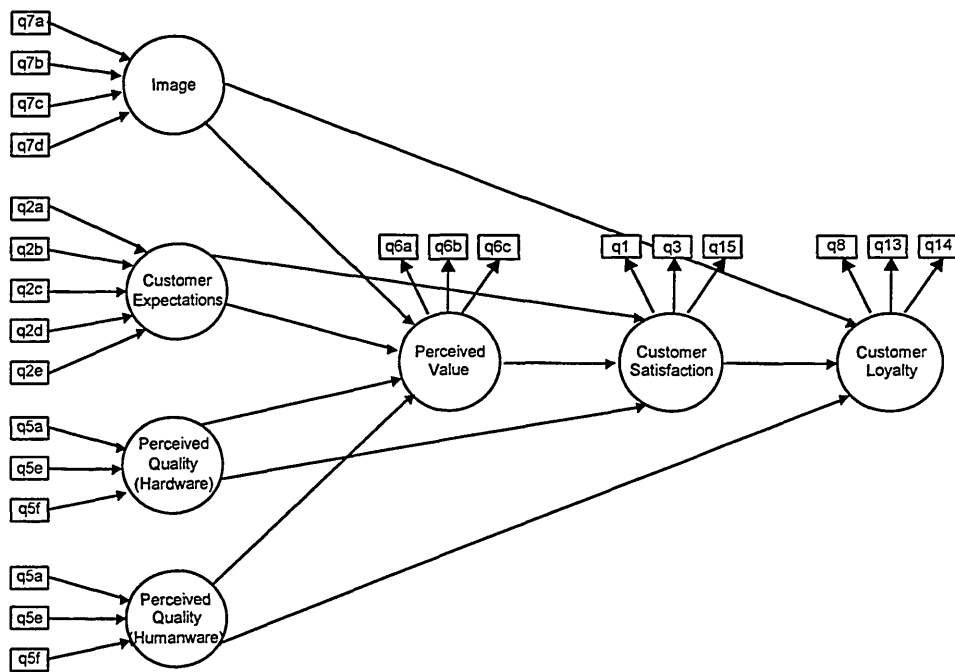


Figure 6 - ECSI model



Appendix 23 - Correlation Results (TQM, 1998)

The tables below show the correlation's between the variables, which feed in to the exogenous latent variables (human quality, hardware quality, expectations and image) in the SEM.

Table - Human Quality Vs Perceived Expectations

Expectations	Human Quality				
	Q5a	Q5b	Q5c	Q5f	Q5g
Q2a	0.4828 P=0.000	0.5036 P=0.000	0.5077 P=0.000	0.1660 P=0.122	0.2312 P=0.030
Q2b	0.3002 P=0.004	0.3034 P=0.004	0.3120 P=0.003	0.2511 P=0.018	0.2347 P=0.028
Q2c	0.3135 P=0.003	0.2787 P=0.009	0.3188 P=0.002	0.1736 P=0.106	0.1830 P=0.088
Q2d	0.2238 P=0.036	0.1918 P=0.073	0.2132 P=0.046	0.2497 P=0.019	0.2579 P=0.015
Q2e	0.3618 P=0.001	0.3415 P=0.001	0.3166 P=0.003	0.2358 P=0.027	0.3390 P=0.001

Table - Hardware Quality Vs Perceived Image

Hard Quality	Image			
	Q14a	Q14b	Q14c	Q14d
Q5d	0.5754 P=0.000	0.5573 P=0.000	0.0598 P=0.580	0.5837 P=0.000
Q5e	0.2711 P=0.011	0.2598 P=0.014	0.0512 P=0.635	0.2676 P=0.012

Table - Human Quality Vs Hardware Quality

Human Quality	Hardware Quality	
	Q5d	Q5e
Q5a	0.5376 P=0.000	0.5724 P=0.000
Q5b	0.5550 P=0.000	0.4966 P=0.000
Q5c	0.5565 P=0.000	0.5140 P=0.000
Q5f	0.5678 P=0.000	0.2396 P=0.25
Q5g	0.6107 P=0.000	0.3267 P=0.002

Table - Human Quality Vs Perceived Image

Human Quality	Image			
	Q14a	Q14b	Q14c	Q14d
Q5a	0.3168 P=0.003	0.3822 P=0.000	0.1428 P=0.185	0.3886 P=0.000
Q5b	0.3587 P=0.001	0.4417 P=0.000	0.1863 P=0.082	0.4257 P=0.000
Q5c	0.4196 P=0.000	0.4692 P=0.000	0.2803 P=0.008	0.4495 P=0.000
Q5f	0.7083 P=0.000	0.5871 P=0.000	0.2098 P=0.050	0.6971 P=0.000
Q5g	0.7358 P=0.000	0.7122 P=0.000	0.1300 P=0.227	0.8035 P=0.000

Table - Hardware Quality Vs Perceived Expectations

Expectations	Hard Quality	
	Q5d	Q5e
Q2a	0.3153 P=0.003	0.33340 P=0.001
Q2b	0.3977 P=0.000	0.2957 P=0.005
Q2c	0.3072 P=0.004	0.3856 P=0.000
Q2d	0.2436 P=0.022	0.1195 P=0.267
Q2e	0.3587 P=0.001	0.3741 P=0.000

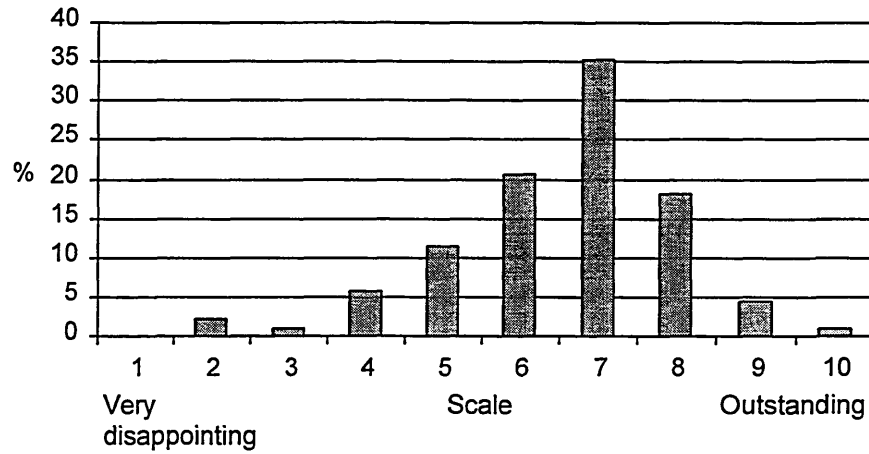
Table - Perceived Expectations Vs Perceived Image

Expectations	Image			
	Q14a	Q14b	Q14c	Q14d
Q2a	0.1925 P=0.072	0.2752 P=0.009	0.2210 P=0.39	0.2196 P=0.40
Q2b	0.1796 P=0.099	0.1723 P=0.109	0.1954 P=0.68	0.1738 P=0.105
Q2c	0.1159 P=0.282	0.1436 P=0.182	0.1319 P=0.221	0.2242 P=0.036
Q2d	0.1347 P=0.211	0.1647 P=0.125	0.2576 P=0.015	0.1193 P=0.268
Q2e	0.1729 P=0.107	0.2681 P=0.012	0.1716 P=0.110	0.2106 P=0.049

Appendix 24 - Results by question (TQM, 1998)

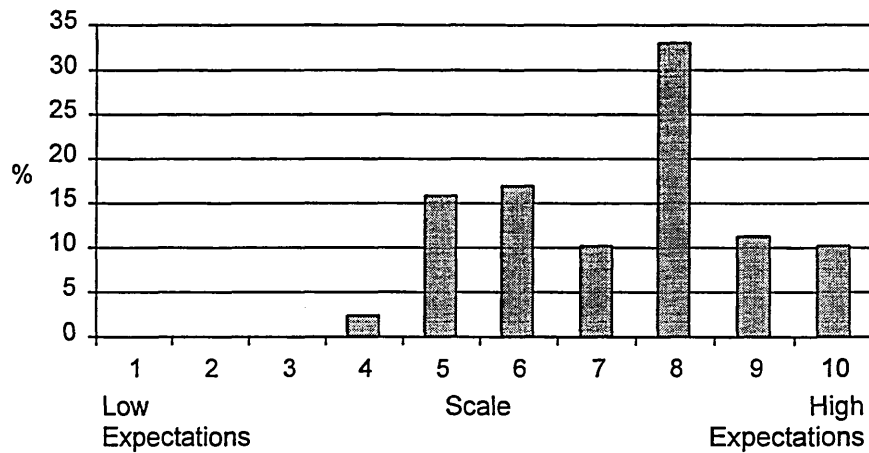
This appendix contains the results for each individual question.

- Question 1)** - Thinking of your overall experience with the Congress, all things considered, how would you describe your experience ON THIS OCCASION?

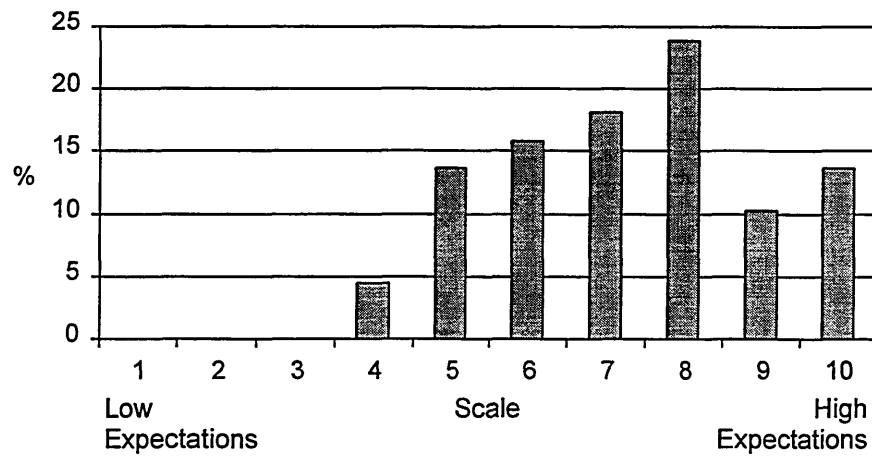


- Question 2)** - What were your expectations before the conference of the following items:

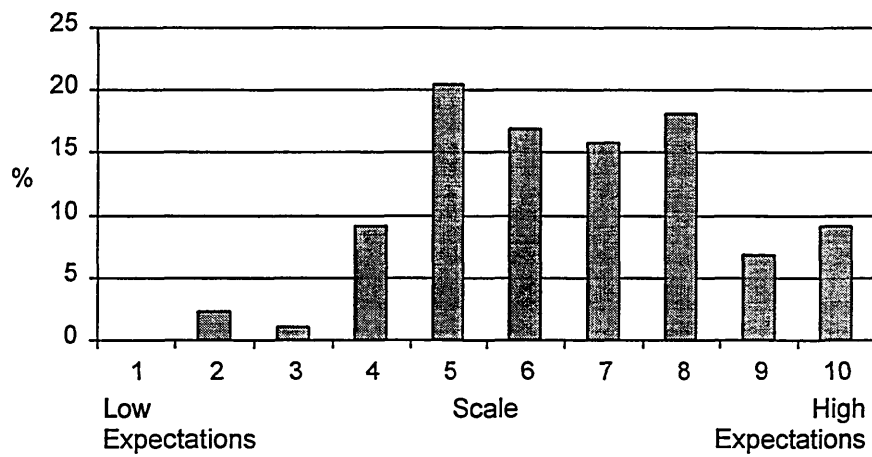
Overall Staff Service



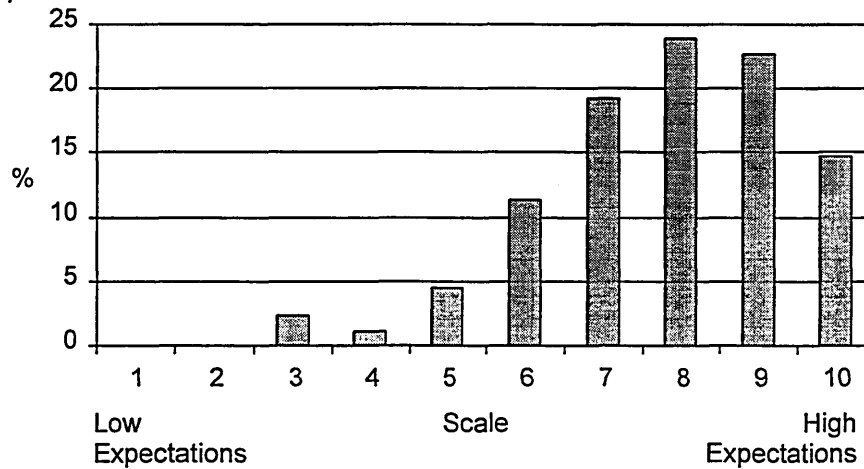
Conference Venue Facilities



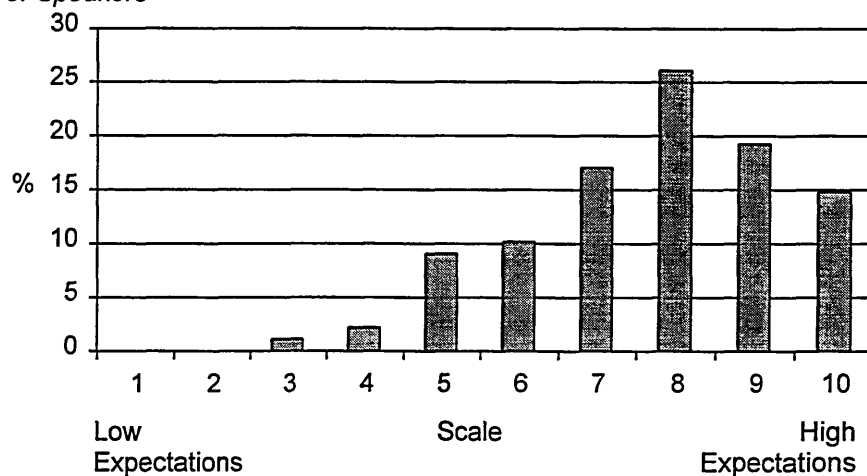
University Catering Facilities



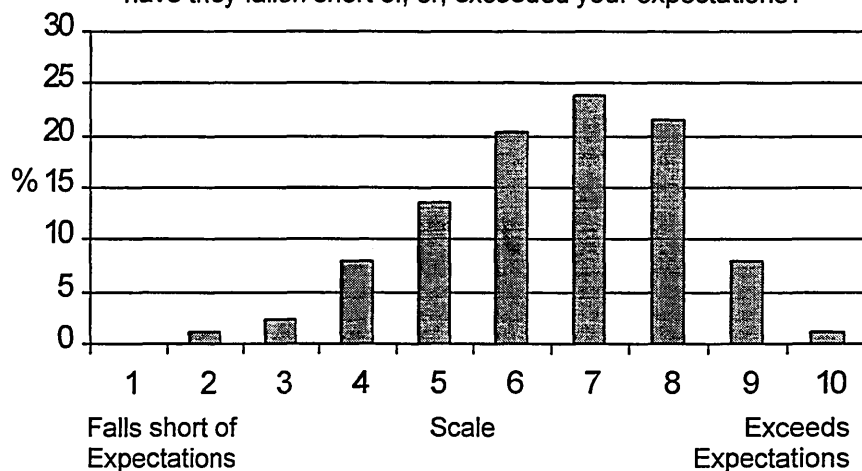
Quality of Speakers



Relevance of Speakers



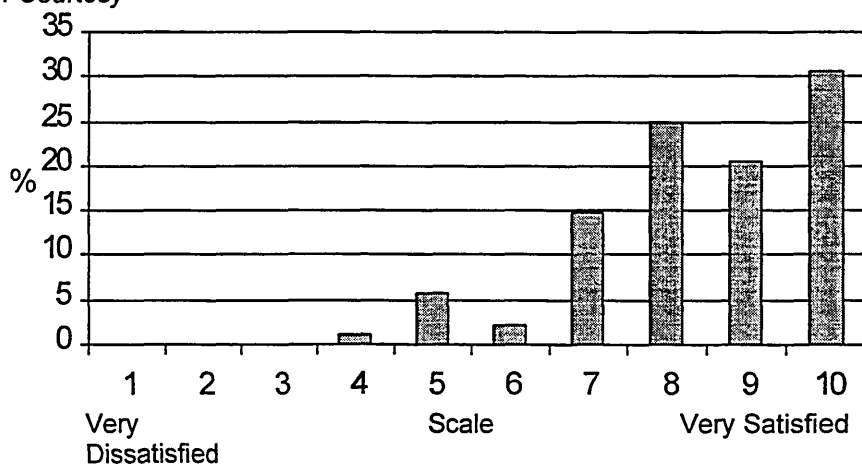
Question 3) - In relation to the services that you receive from Congress, to what extent have they fallen short of, or, exceeded your expectations?



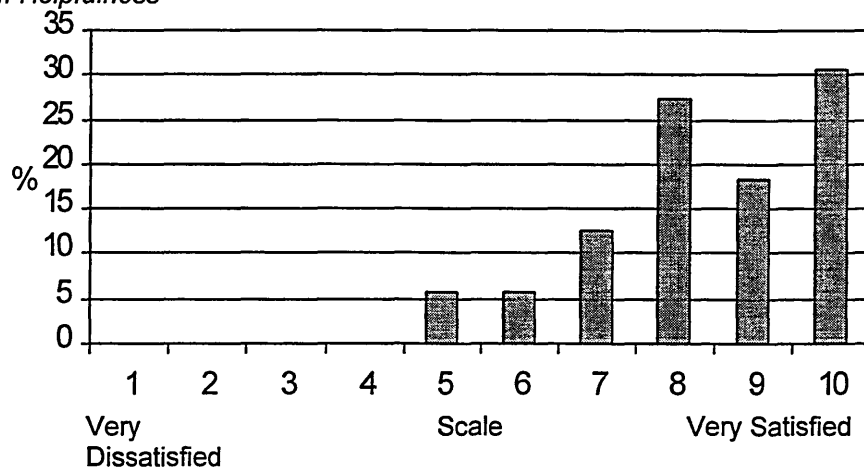
Due to an error on the questionnaire, there was no Question 4).

Question 5) - How satisfied were you with each of the below?

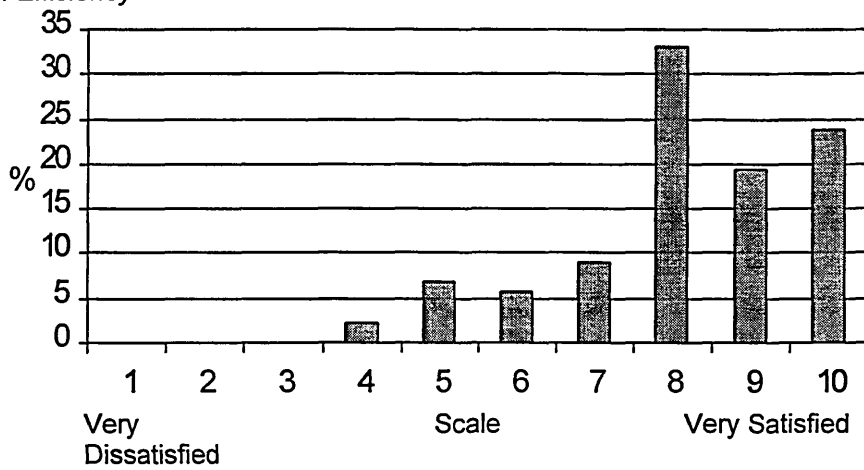
Overall Staff Courtesy



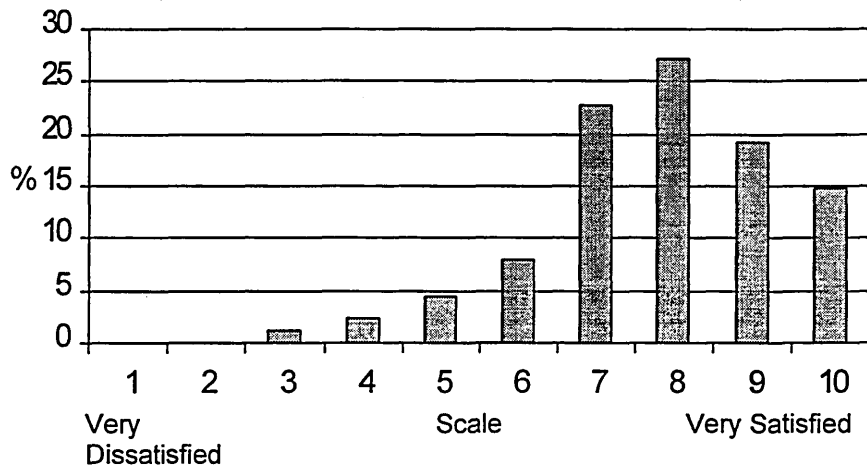
Overall Staff Helpfulness



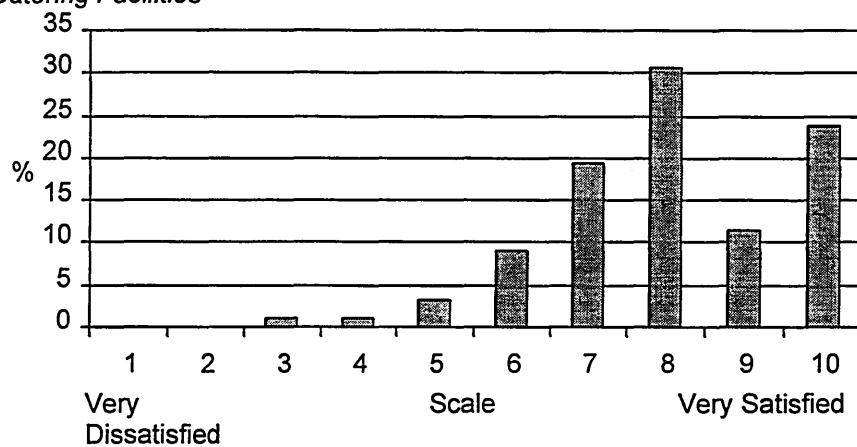
Overall Staff Efficiency



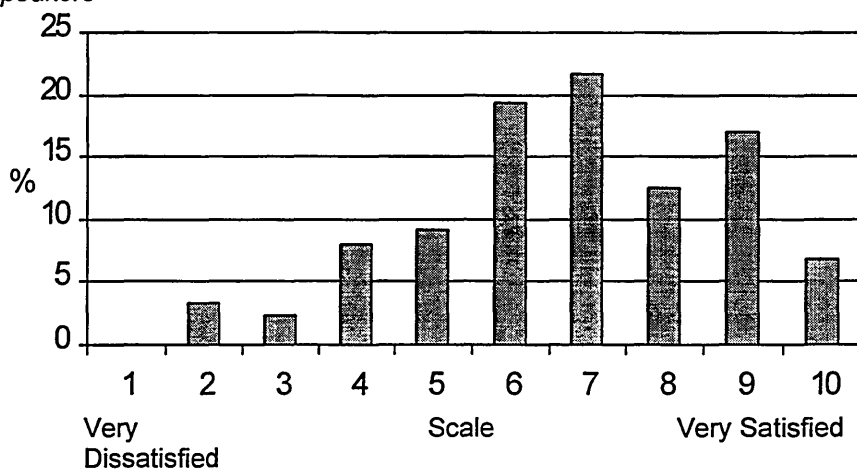
Conference Venue Facilities



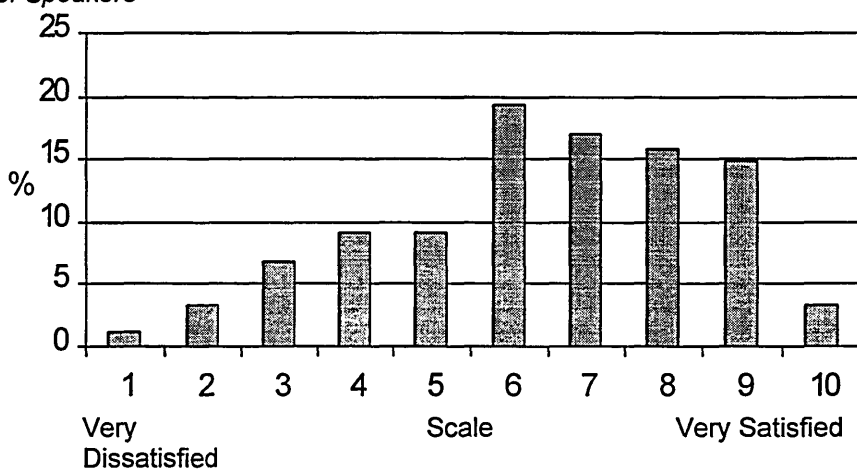
University Catering Facilities



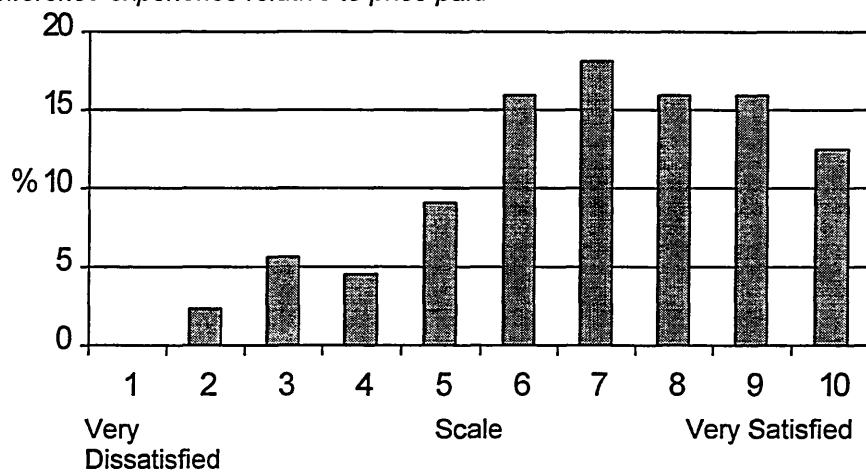
Quality of Speakers



Relevance of Speakers

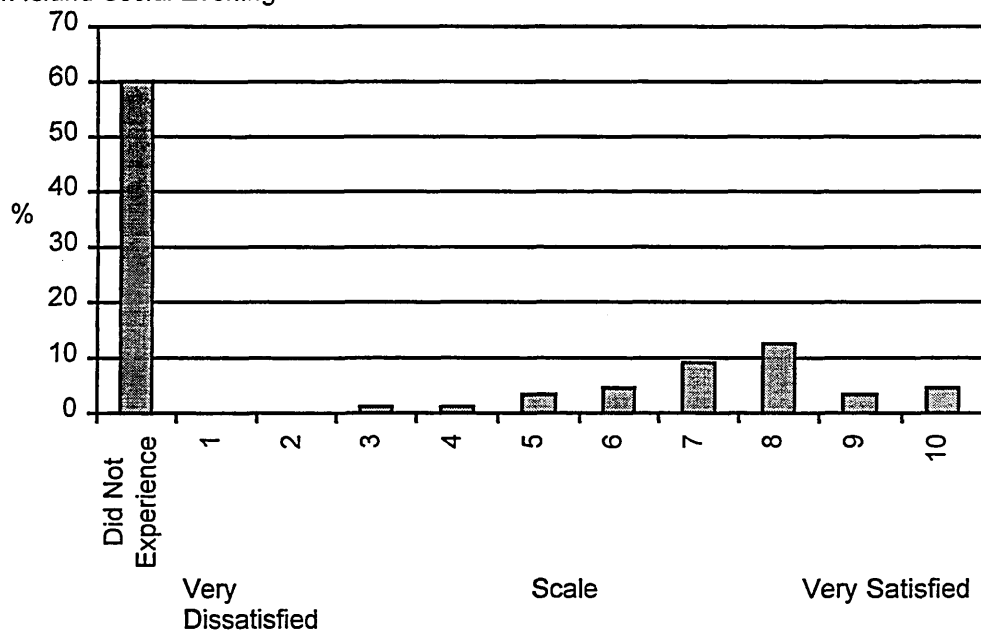


Value of conference experience relative to price paid

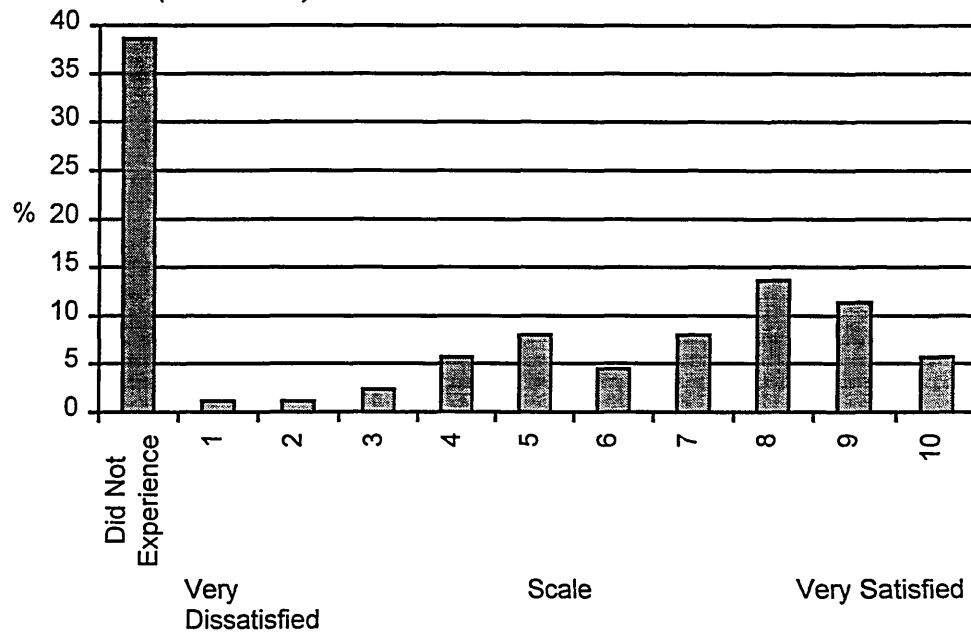


Question 6) - Below are some other services that you may or may not have used. Please indicate how satisfied you were with each other.

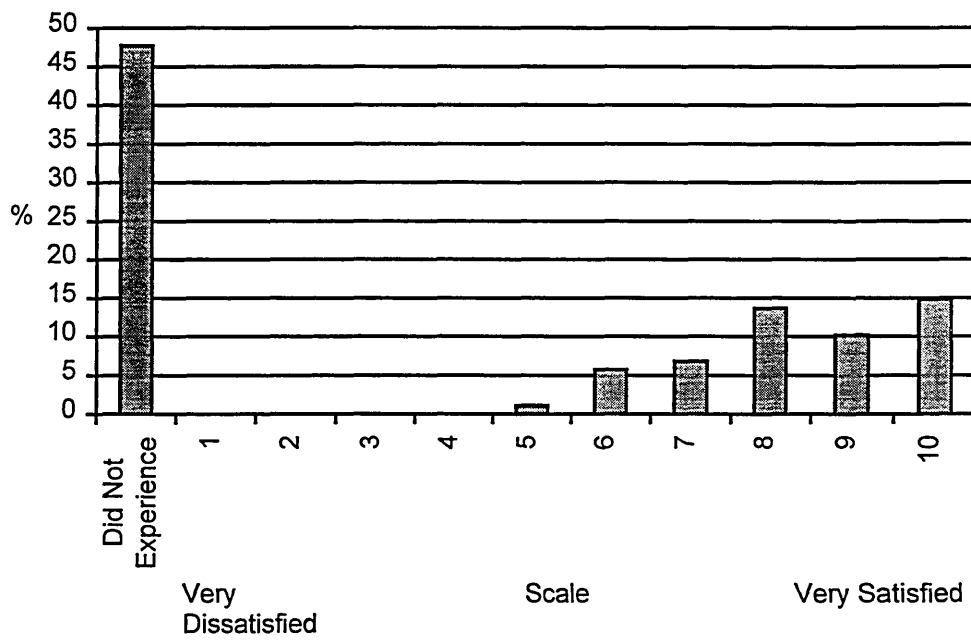
Kehlam Island Social Evening



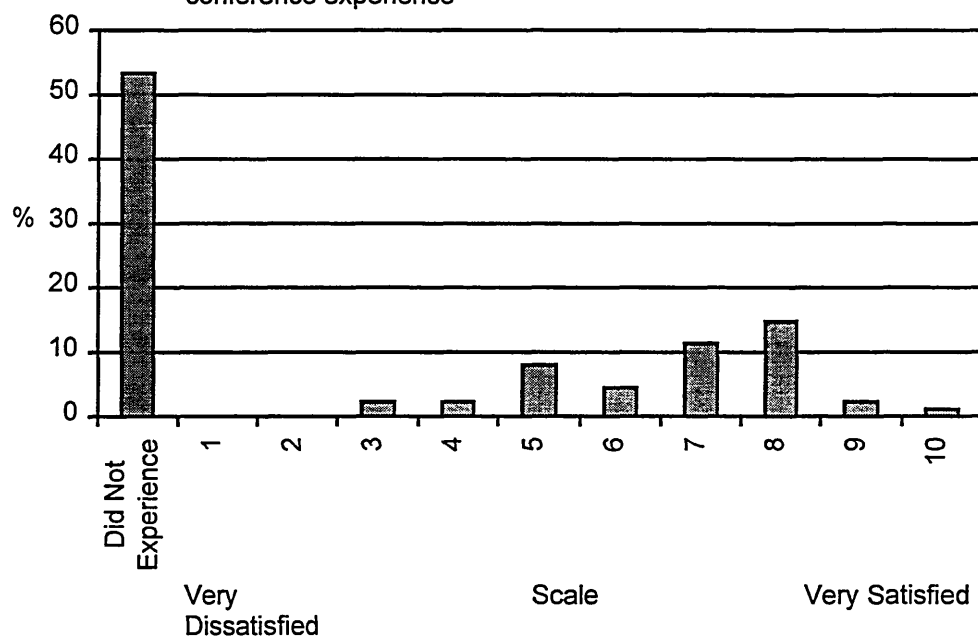
Conference Dinner (Cutlers Hall)



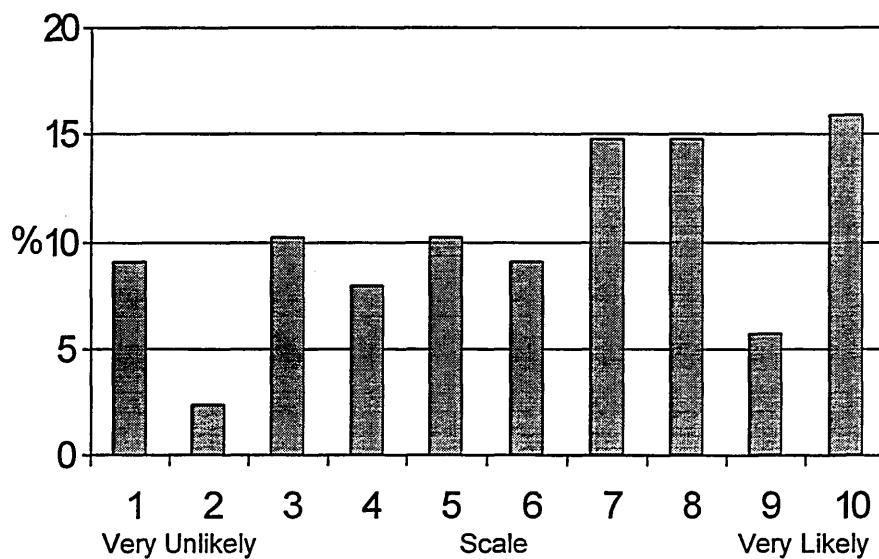
Coach service between hotels, university and social gatherings



Question 7) - Thinking of your most recent previous World Congress of Total Quality Management, please tick the box which best describes your overall conference experience



Question 8) - How likely is it that you will attend the 4th World Congress of Total Quality Management in 1999?



Question 9) - During the Congress, do you feel that you have had cause for complaint?

Yes	18.2%
No	81.8%

Question 10) - Broadly, what were these issues about?

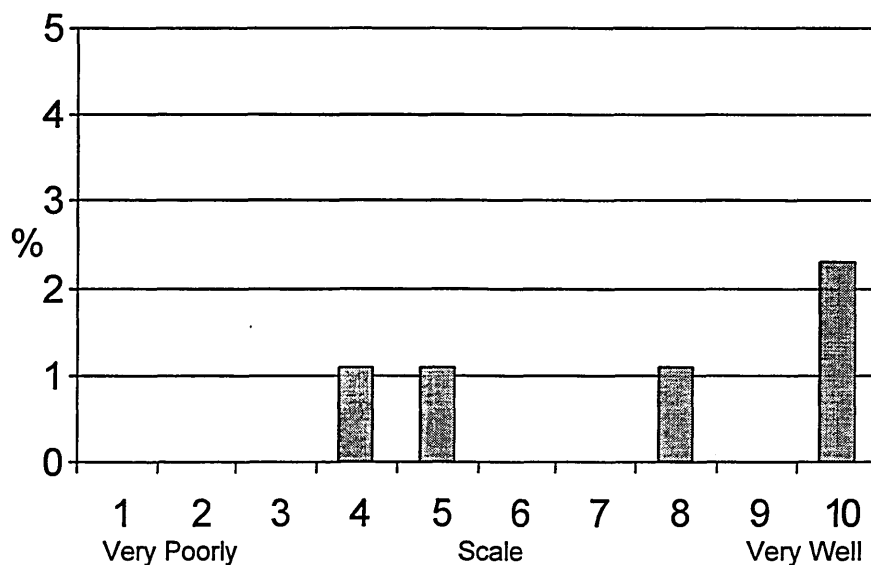
A complete breakdown of the responses to this question can be seen in appendix 25 at the end of this chapter.

Question 11) - Did you report the problem to the conference organisers?

Yes	5.7%
No	14.8%
Did not answer this question	79.5%

Question 12) - How would you rate the way in which the complaint was handled?

94.3% of respondents did not answer this question. For the five that did, the graph can be seen below:

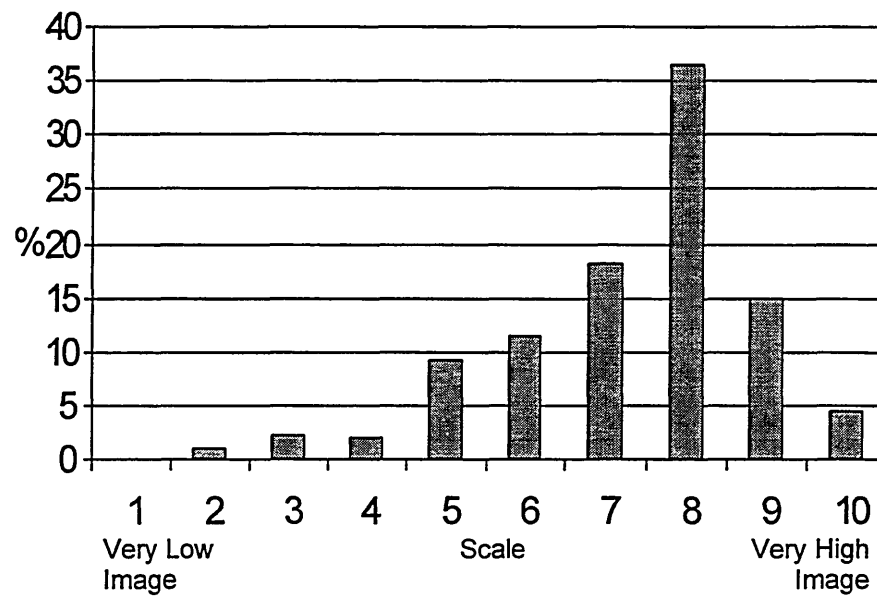


Question 13) - Is this a conference you would recommend to personal friends or associates?

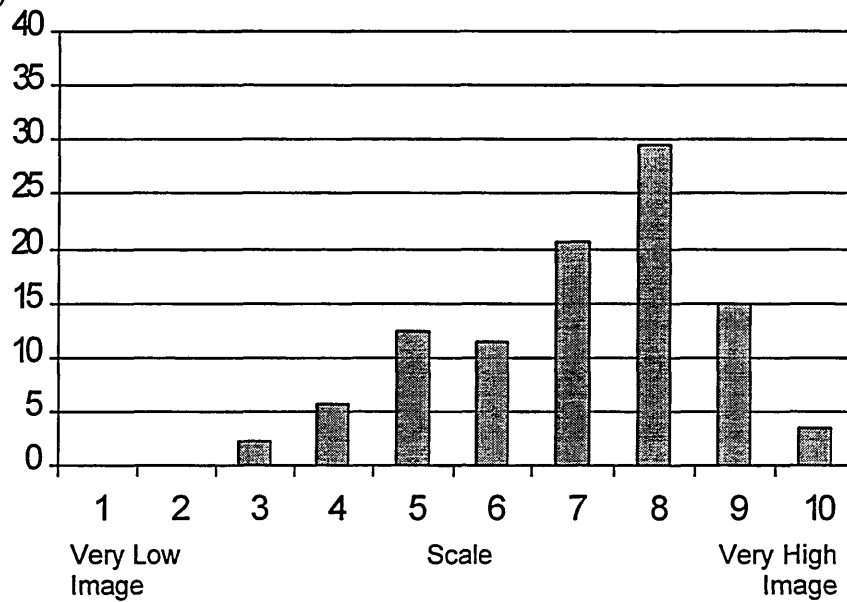
Yes	84.1%
No	15.9%

Question 14) - How would you rate the image of the Congress in terms of being:

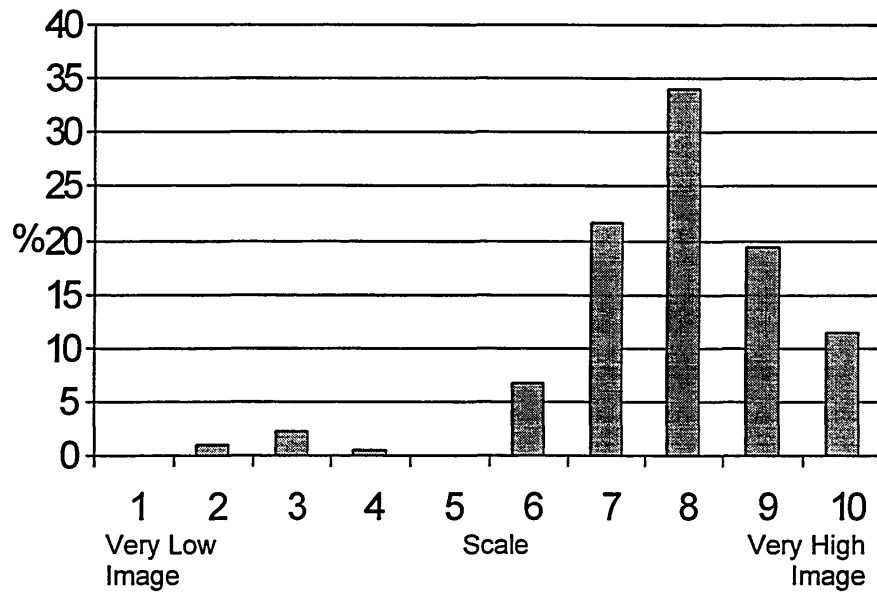
Professional



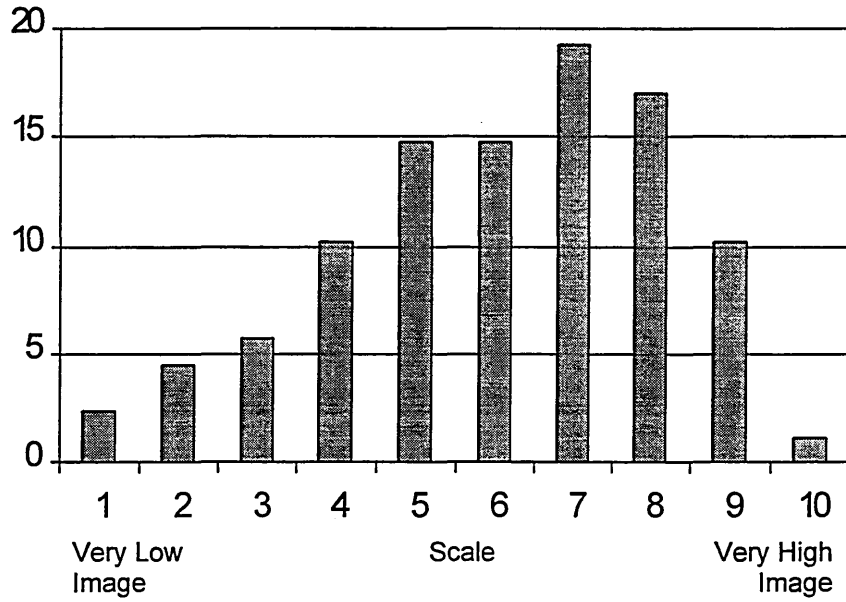
User Friendly



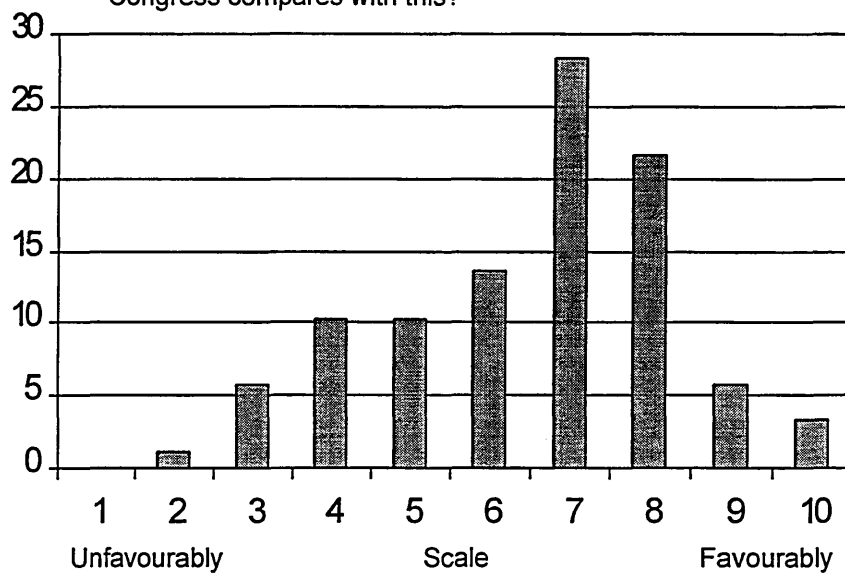
Academic



Applicable to business



Question 15) - If you can imagine an ideal conference, how well do you think the Congress compares with this?



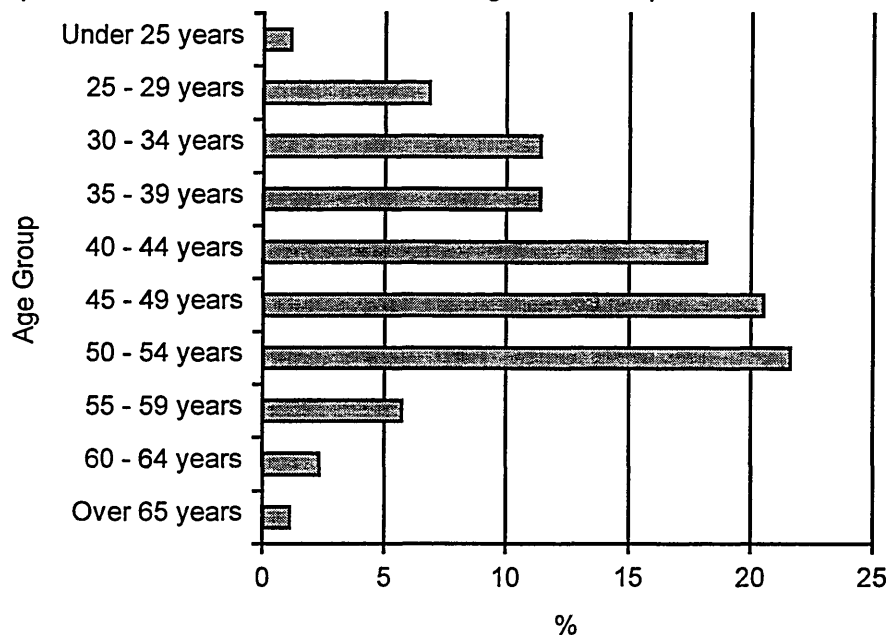
Question 16) - Are there any other areas or issues connected with the Congress that you would like to make further comment about?

A full list of comments can be seen in appendix 26.

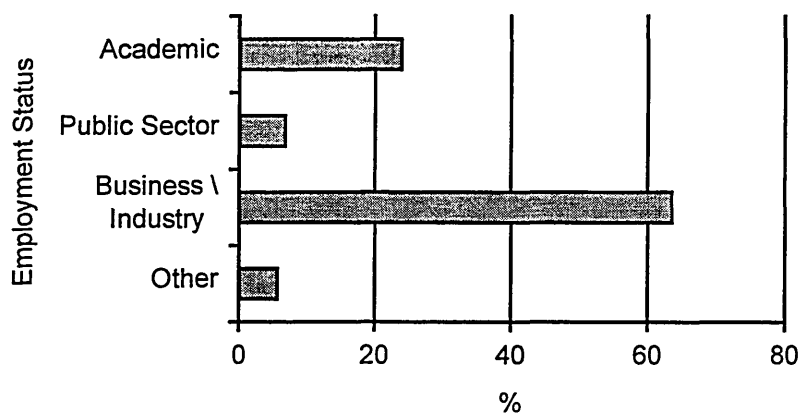
Personal Details

- In total 88 people returned the questionnaire out of 164 originally mailed out.
- 73.9% of the respondents indicated that they were male with the remaining 26.1% being female.

- The graph below shows the breakdown of the ages of the respondents:



- The graph below shows how the respondents classified their profession:



Appendix 25 - Comments from question 10. (TQM, 1998)

Comments have where possible been types as written on the questionnaire. Spellings where possible have been corrected. Where underlines have been used '_____', these indicate a word that could not be read.

- I felt some of the talks were perhaps too academic and not of much practical use to those in business who have to implement the principles. However, I accept there has to be a balance of theory and practical approaches.
- I was concerned in one session on the manner of the chairperson to the presenters. The chairperson was _____ discourteous in discounting the presentations. I do hope this was an exceptional event.
- I cannot see the point of splitting up into groups to lecture to 6 people. Be more selective when splitting up suggest only 2/3 topics.
- One room not appropriate. The speaker on Health and Leisure Centre was poor yet was allowed twice as long as the next of the speakers.
- Strongly suggest that room allocation for parallel sessions should take into account the absolute need for a quiet environment, i.e. no radios or building noise - Norfolk 310.
- Editing of my paper in the proceedings.
- Presentation skills and relevance of some speakers.
- During one of the breakout sessions the noise of building work was intrusive (builders radio, singing outside window). Some of the presenters were poor, launching at, rather than connecting with their audience.
- One of the seminar rooms was next to some building work and it was very difficult to hear the speakers.
- The relevance of speakers. The smaller conference rooms. Incorrect information on bus times.
- The content of the presentation was not able to be applied. I felt some of the presentations were acting as shop windows for presenters services. E.g. there was plenty of information around customer measurement but no examples of questionnaires.
- None availability of plenary papers
- Booked student accommodation - very poor compared with 1997. Room not ready e.g. Beds used, no towels, needed airing etc.
- One speaker distributed sales / marketing material knowingly in con_____ of her "apparent" agreed contract.
- Thought that the congress had been hijacked by academia making the application of quality principles even more difficult. Quality will not be achieved by 'complexity' but by 'simplicity'.

- Presentations by universities visiting to lead seminars on TQM - Some of them had very poor quality visual aids. This applied to the small group seminars.
- The quality of speakers was low. Some subject matter was too academic and irrelevant to the business and real world. More workshops and practical ideas would have been helpful. Dinner at Cutler's Hall was spoiled due to football.
- A) It was not easy to find the rooms for the parallel sessions (PS). B) The time for presentations in PS was not enough and the same for questions.

Appendix 26 - Comments from question 16. (TQM, 1998)

Comments have where possible been types as written on the questionnaire. Spellings where possible have been corrected. Where underlines have been used '_____', these indicate a word that could not be read.

- One speaker decided to speak on another topic than the one advertised in the conference guide. Whilst his actual topic was interesting and well delivered, it would have been better to hear the one scheduled, as I particularly was interested to hear the topic scheduled in the conference guide.
- A world conference should have relevance to / attendants from all over the world: Academic, Profit, Non-profit. This one was focused on academic attendants and the _____ of companies acting as sponsors of the conference. Too few attendants from other countries (e.g. France, Germany, Spain, Italy, Netherlands, US....)
- I was disappointed by the conference dinner. Apart from the distraction of the World Cup, the steel band was far too loud and drowned out any chance of conversation.
- Very average presentation by the University Vice Chancellor.
- The lack of Asian participation was disappointing. The members of University of Taiwan in the past have been very positive.
- Complete discussion on self assessment and its benefits for next year. Belta venue for 1st Energy
- The publication did not include matrices and flow charts that were part of my paper. Unfortunately my paper needed these included to the reader could understand the context.
- First speakers (not Richard Wells) very poor with _____ talks and poor overheads.
- Lack of any communication from editor of proceedings was a bit disappointing, particularly as our paper was edited more than necessary to fit page length limit.
- Too much academia in breakout sessions. Widely differing quality in speakers. The Head of the university in the US cannot have been adequately screened! More care in selection of speakers and their content. NB. Do you have videos \ audio of plenary sessions?
- This years conference seemed too academic based.
- It was unfortunate that the dinner was held on the evening of England's dismissal from the World Cup. I did not appreciate ____ at the occasion - it was a distraction. I wonder what over seas visitors felt. Attending by myself, I would have welcomed a table plan for seating.
- The level and "quality" of the conference attendees needs to be increased.
- It would be helpful if academic or business relevance specified in brochure.
- Should encourage all speakers to consider their audience when presenting in terms of making the content relevant / understandable / motivating for delegates.

-
- The VCs opening address and gala response was poor. The steel band and TV was overwhelmingly loud - preferred the silver band in the balcony at the gala dinner.
 - There were disappointingly fewer business people and too many academics this year.
 - I thought all speakers were v. Good, but there was quite a lot of duplication in content. It would have been useful to hear more experience of different approaches which have worked although using the same core framework. This would have given more ideas for application in practice than theory.
 - The time allowed for presentations is too short - Should be 25 minutes presentation + 5 minutes Q & A.
 - For me the congress was tending to be too academic, it is also very tiring taking in the range of ideas proffered. On the other hand I wanted to be exposed to a range of ideas including academic studies. I think you should look to increase the submissions from industry, but they have to be of a high standard. EE the HSE could have been asked to present a paper relating to safety management systems which are based on quality systems theory.
 - The staff organisation, catering etc. was very well done, all seemed to run smoothly. It was enjoyable and well run.
 - Catering excellent. Catering staff was excellent. Printed proceeding should be grouped under the session headings and in that sequence so that delegates can find them easily.
 - I only attended the first day. The am speakers were fine - the professionalism of Richard Wells presentation met my expectations. The speakers in the pm session were generally fairly poor. This is what let the event down. I expected leading edge stuff. Generally I learnt little. Perhaps I am at the leading edge.
 - It was a pity that there was only one chance to go to any workshop groups. I often wanted to attend part of 3 different workshops - maybe running all workshops twice would help.
 - I did feel that the talks were not quite "at the cutting edge" as the previous year; and the American who brought his family was stunningly poor choice. Decisions like that make me wonder at the organisers thinking and damage their credibility. A number of the 'small talks' were good and interesting! Perhaps follow up their work next year.
 - This congress had a much more academic feel than last years, in particular there appeared to be less 'shop floor' learners and practitioners than previously.
 - I feel it is becoming too academic in nature. More emphasis on what organisation are doing.
 - The smaller group sessions would benefit from, a) greater practical input, and, b) where research is presented ; that it has some practical conclusions to offer. Also clearer description of optional sessions would aid choice.
 - I want to discover new ideas not go over the past. Presentations such as those given by Myron Tribus, Kostas Derviotis and Jans Dahlgaard were useful. Those given by British Steel, Auburn University and BT were of very little use. I only attended the first day and it [was] interesting and stimulating. Possibly having the choice of a number of workshops
-

would be an improvement. This would mean having various rooms available, and may not be practical.

- Not all of the presentations were contained within the published conference papers and no hand out was given. E.g.. Joyce Orsini - Troubleshooting for excellence.
- Authors should be asked to produce papers in photo-ready copy for publication 'as is'. No need for a 'glossy' extended digest of papers. Give full text in cheap production format since delegates can't attend all presentations.
- Editing the papers prevents them from being submitted in RAE i.e. cutting refs. from 20+ to 5! - Not a good idea. It was good to mix with practitioners and this is a strength of the congress.
- Conference chairmen (breakout sessions) should be careful not to give negative feedback to presenters in front of the audience as part of their summing up. I was not a presenter, but as a member of an audience saw this happen. It appeared the chairman did it to massage his own ego. He should have done it 1:1 outside the session. Session by H Bajaria on Wed pm was very poor for a plenary session - it had little new content and no clear learning of practical message.
- The split sessions are useful to ensure relevant coverage but a synopsis available for each talk at least 1 week in advance of the conf. would have allowed more time to select the relevant ones. Titles were misleading.
- Continue with the involvement and real issues of how TQM is working for business.
- Given the number of sessions on offer, I feel I've probably missed some relevant papers along the way . To a certain extent this is mitigated by the proceedings documentation which is very good.
- As ones knowledge and experience of TQM grows it becomes increasingly more difficult to learn very much by attending a conference. The main benefit for me is the networking opportunities it brings.
- Please give us more relevant, practical ideas and presenters who work in business.
- Cutler's Hall was a unique experience but I felt the speaker did not have the respect they should have had due to the football match and two TVs. People came to the conference dinner to hear the speakers , but because of a small number of delegates and football match, this did not happen.
- The standard of presentations varied enormously, from truly excellent to very poor - a difficult one to crack but something that needs to be addressed. From a Guinness perspective, some presentations were too academic and it was difficult to see there relevance to modern business / application of the information.
- Re. "Professional" - Contributory sessions chairs need to be more highly skilled. Even biographical details supplied are not referred to. No attempt to link \ summarise - suggest chairs briefing session if not already done. "Academic" - Too much "show and tell".

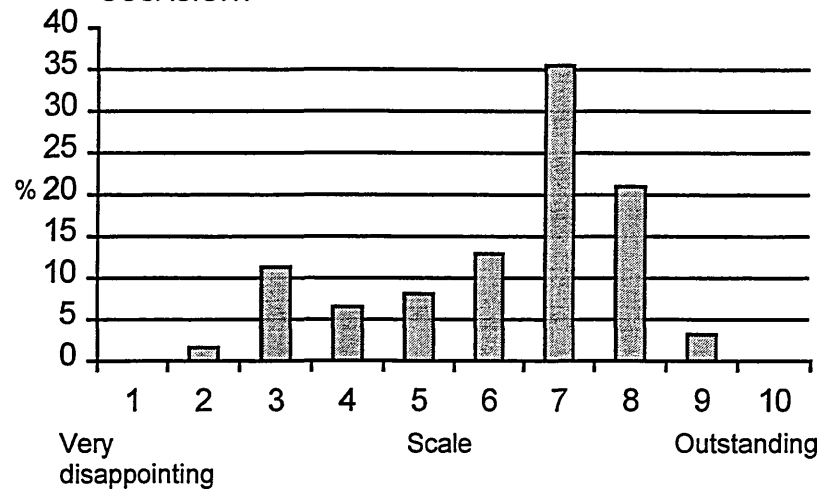
Insufficient rigorous critical debate. Is it possible to have one contributory session aimed at research presentations / scholarly papers.

- A) Having it as an annual event, with a smaller base than big organisations to draw speakers and participants, it may have to lower quality to keep going, which will eventually make it less attractive. B) The organisers do a very good job, but Sheffield is not like Paris, Rome or Barcelona to attract participants for complementary to Congress activities. C) Having this as a biannual event, might help bring in better presentations and more participants.
- Question 14): Kehlam Island was also the social evening the year before. The football match during the dinner was not nice. More handouts available for all plenary lectures.

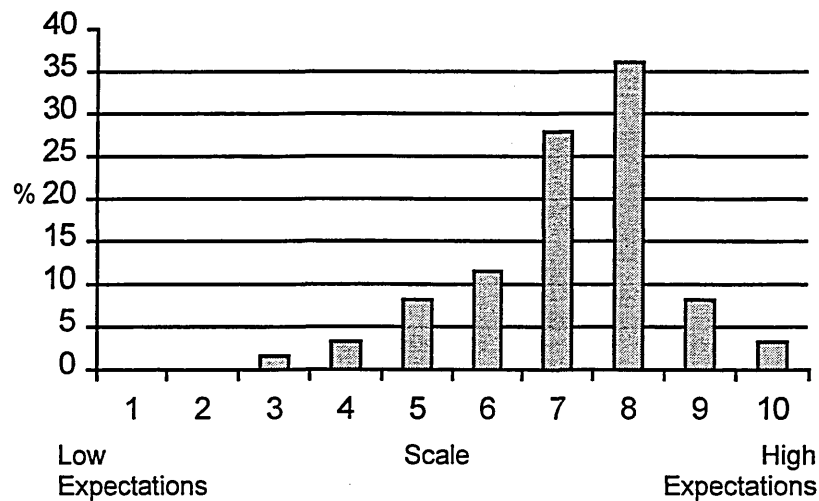
Appendix 27 - Results by question (TQM, 1999)

This appendix contains the results for each individual question.

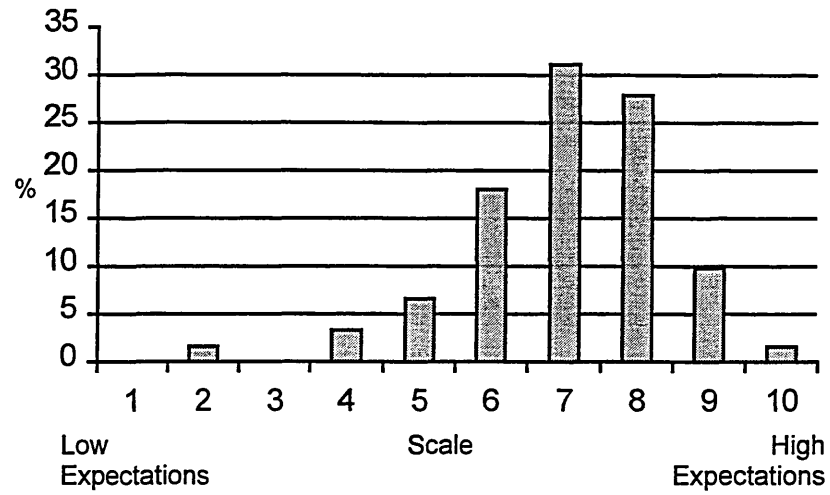
Question 1) - Thinking of your overall experience with the Congress, all things considered, how would you describe your experience ON THIS OCCASION?



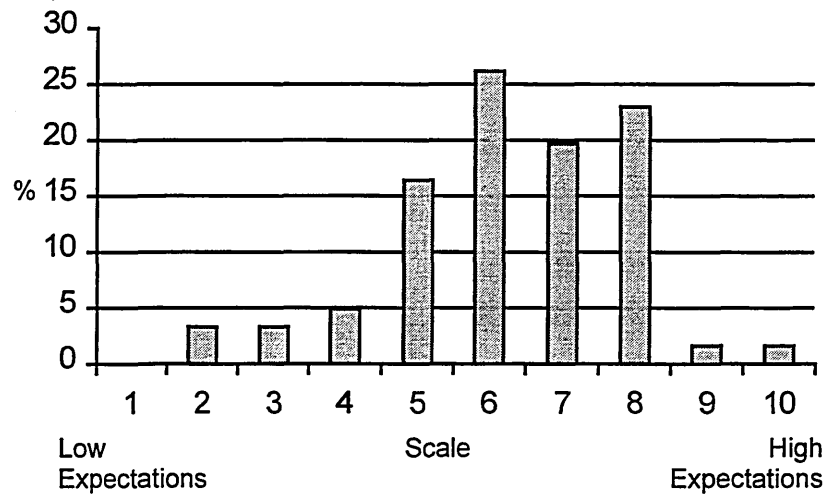
Question 2) - What were your expectations before the conference of the following items:
Range of Topics



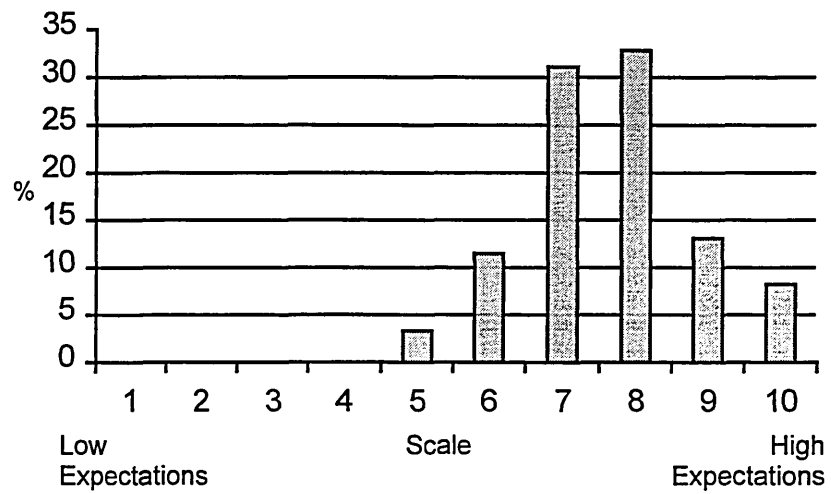
Conference Venue Facilities



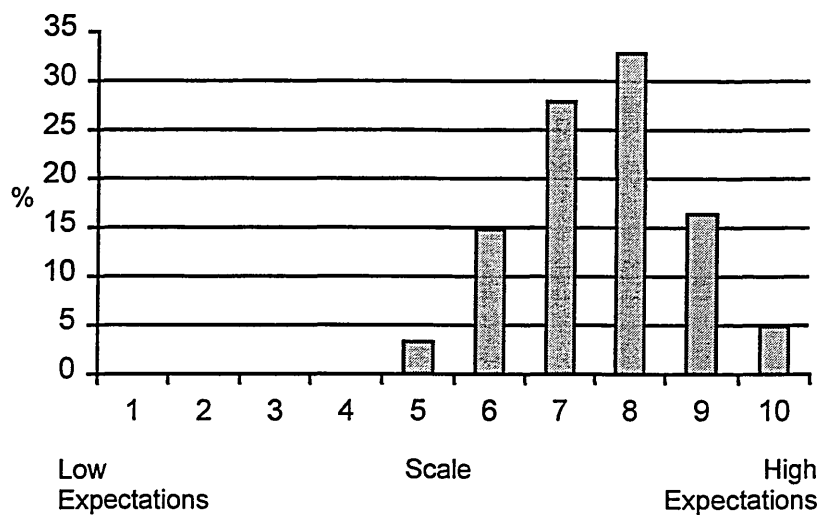
University Catering Facilities



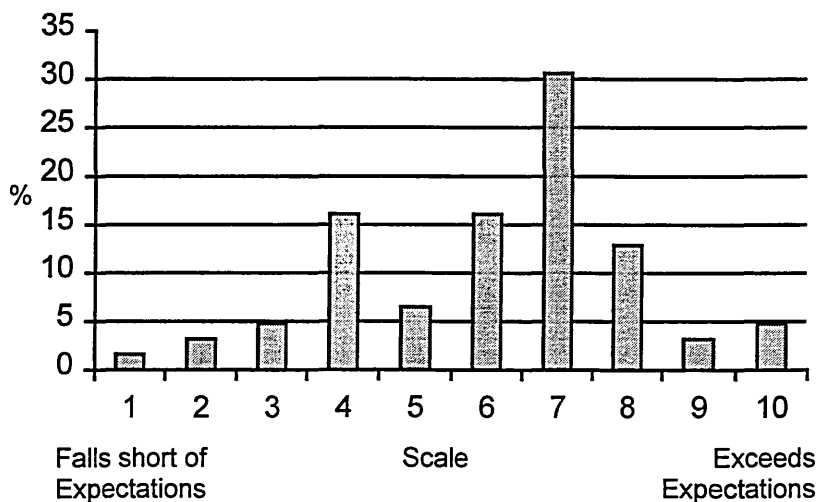
Quality of Speakers



Relevance of Speakers

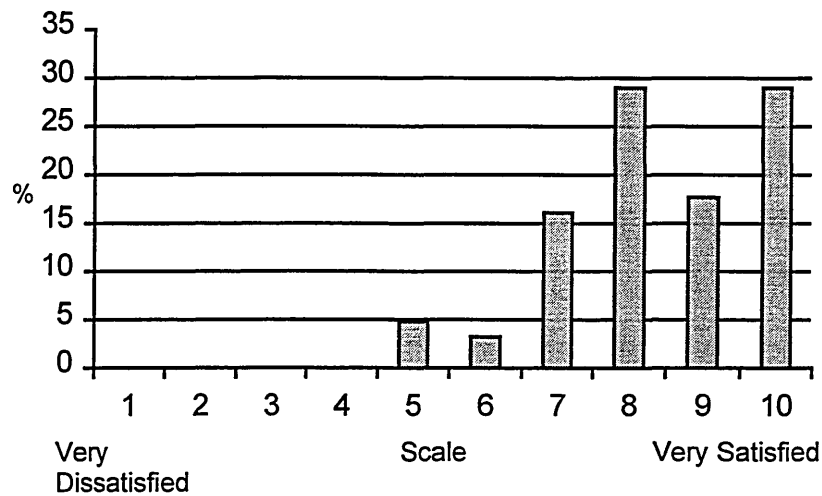


Question 3) - In relation to the services that you receive from Congress, to what extent have they fallen short of, or, exceeded your expectations?

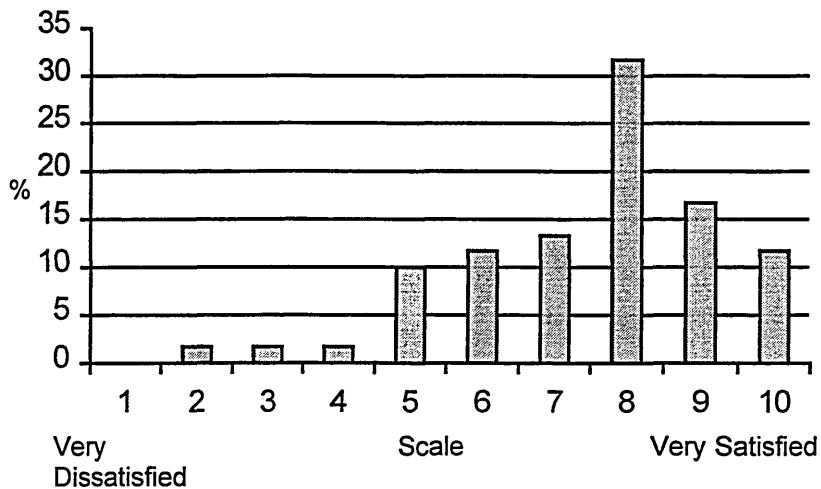


Due to an error on the questionnaire, there was no Question 4).

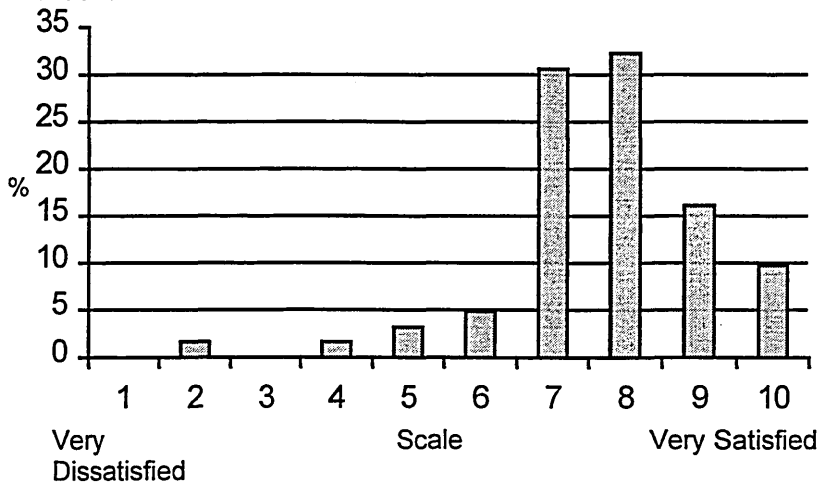
Question 5) - How satisfied were you with each of the following items?
Overall Staff Courtesy



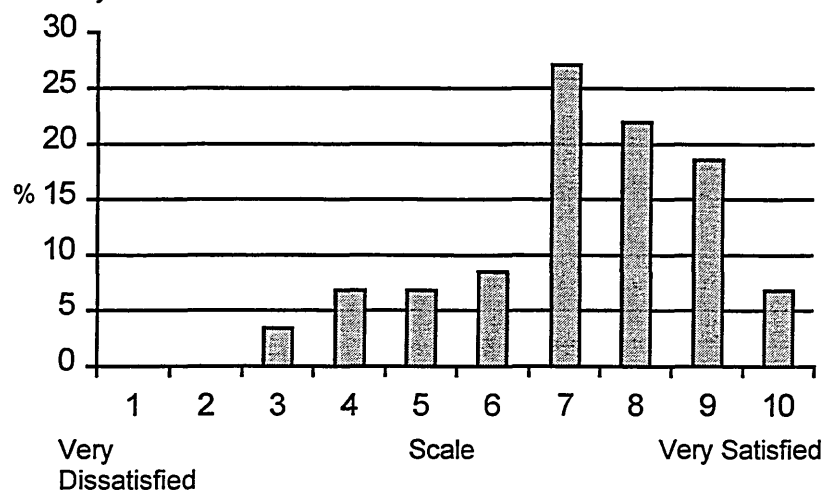
The locations of the syndicate rooms



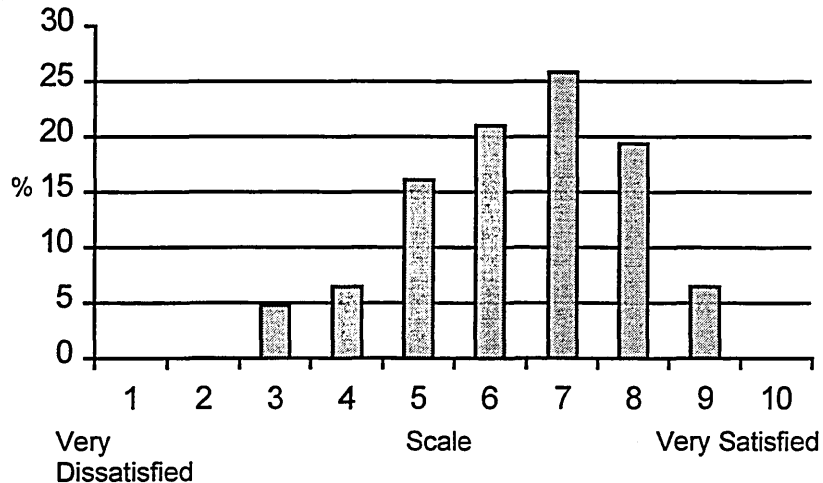
Conference venue facilities



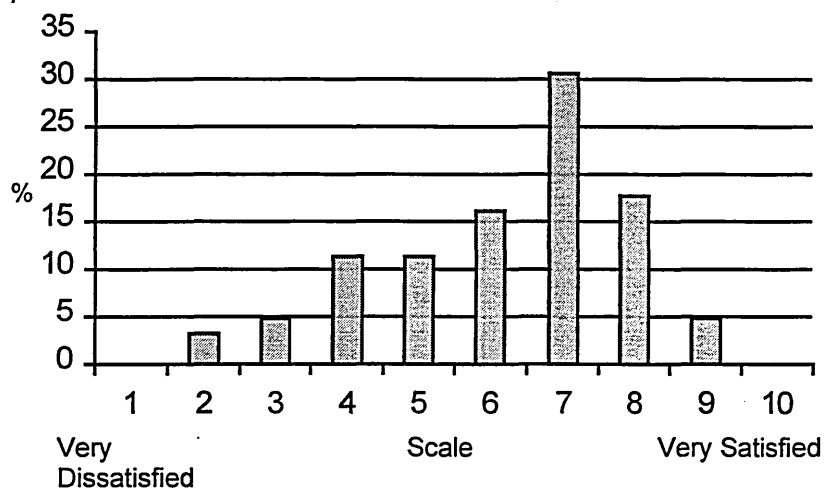
How well did it match yours needs



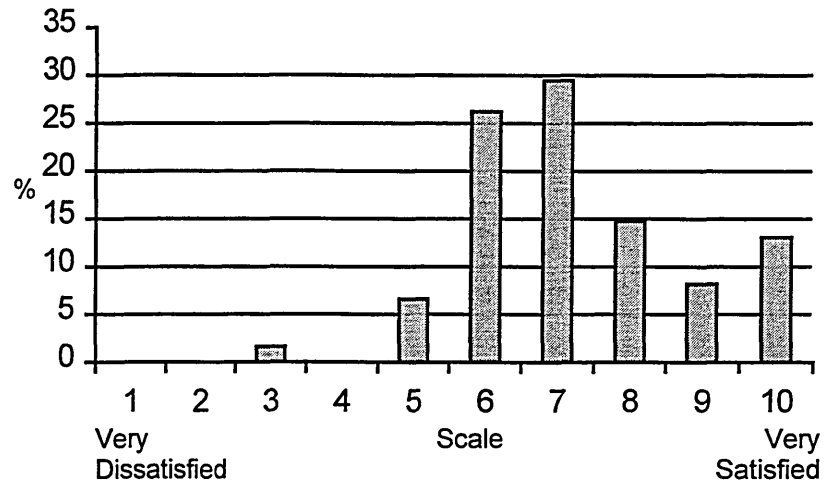
Quality of speakers



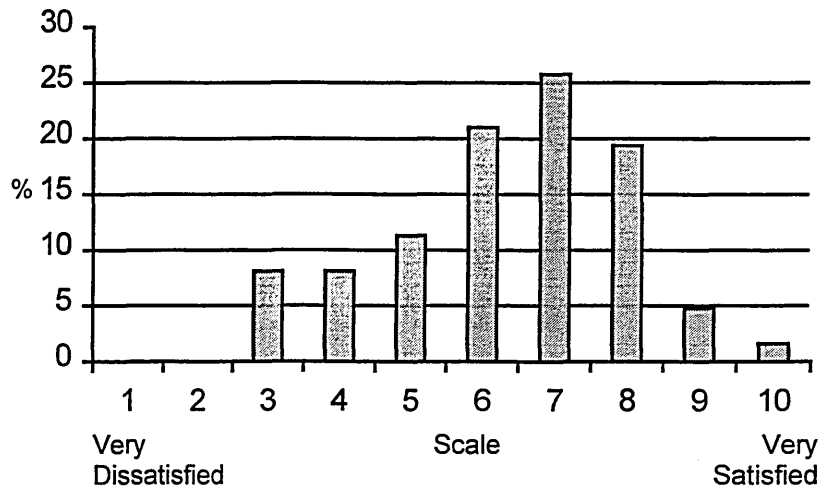
Relevance of speakers



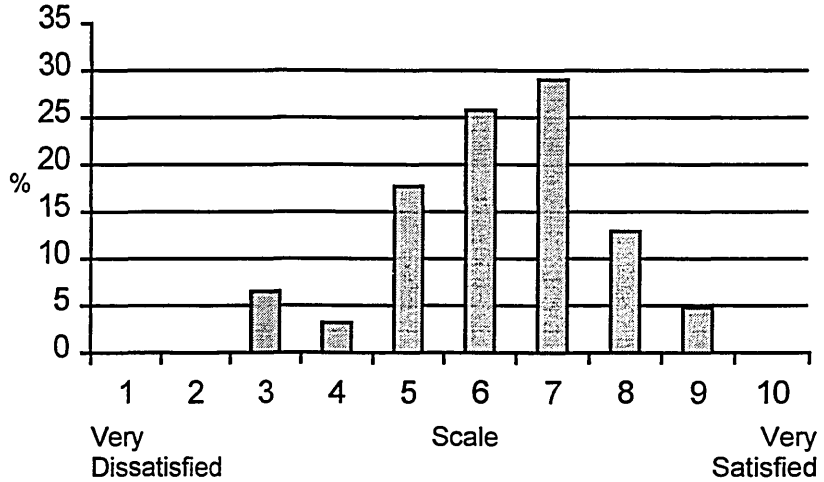
Question 6) - How do you value the cost of the conference in relation to:
The service received



Assortment of speakers

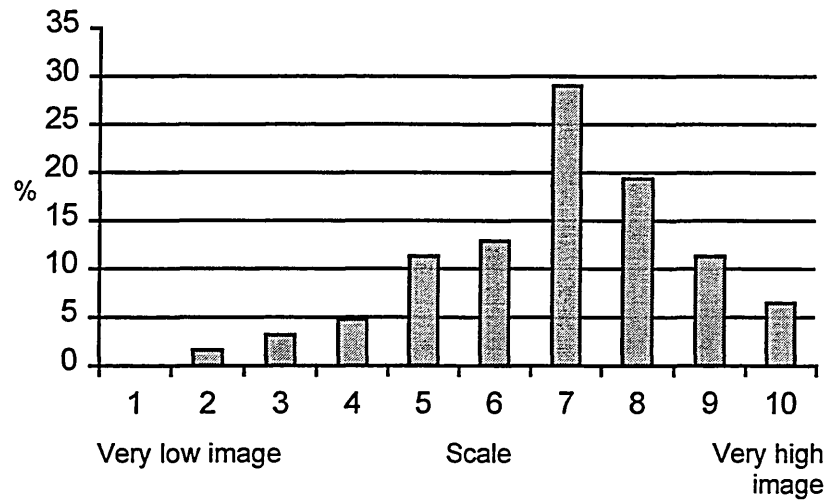


Quality of speakers

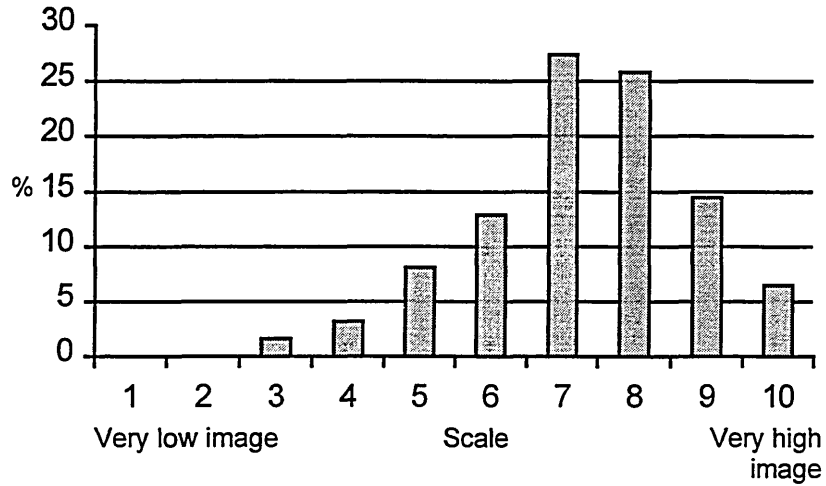


Question 7)
Professional

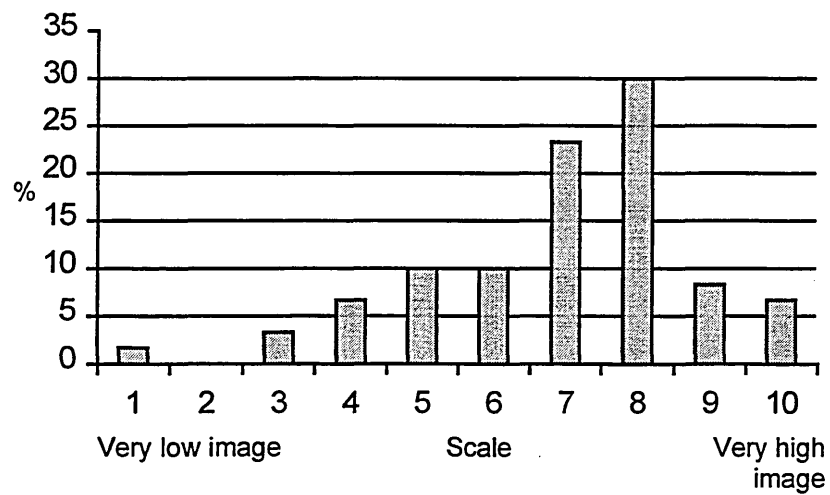
- How would you rate the image of the Congress in terms of being:



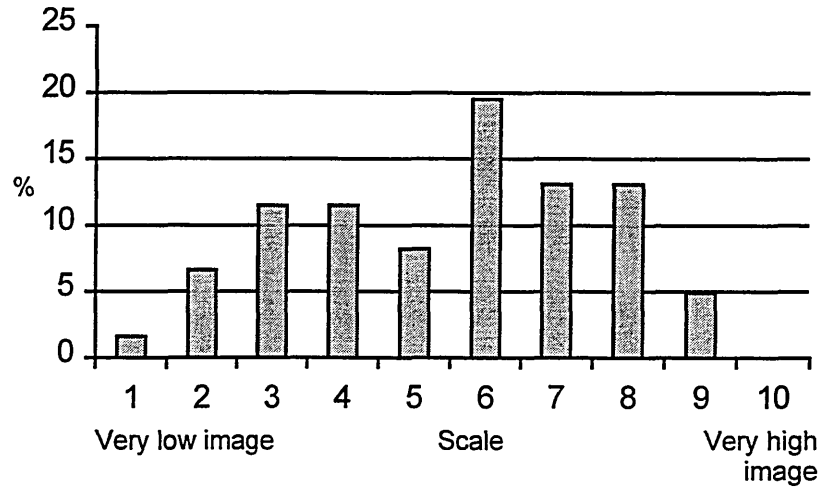
User friendly



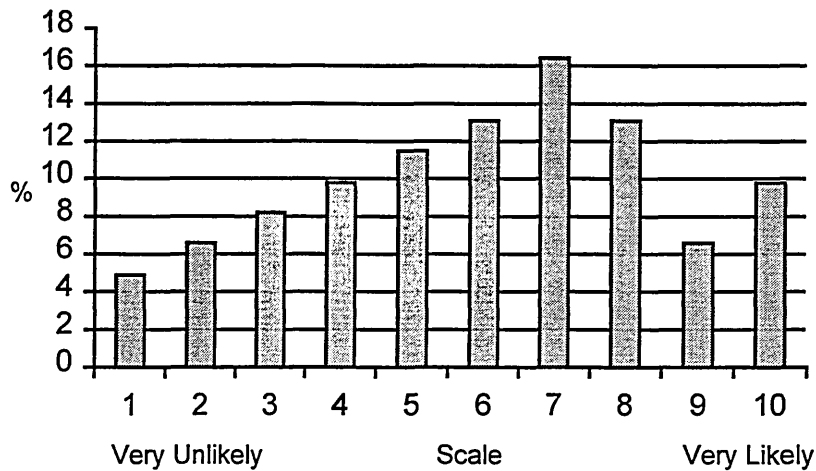
Academic



Applicable to business



Question 8) - How likely is it that you will attend the 5th World Congress of Total Quality Management in 1999?



Question 9) - During the Congress, do you feel that you have had cause for complaint?

Yes	24.6%
No	75.4%

Question 10) - Broadly, what were these issues about?

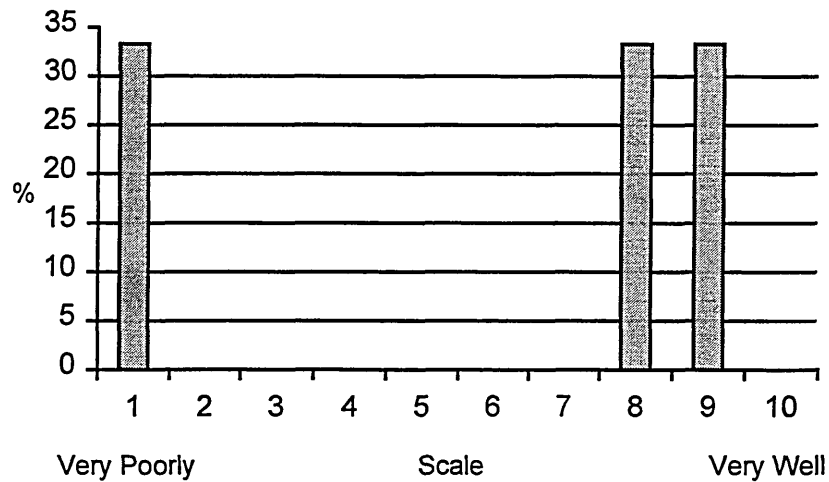
A complete breakdown of the responses to this question can be seen in appendix 28 at the end of this chapter.

Question 11) - Did you report the problem to the conference organisers?

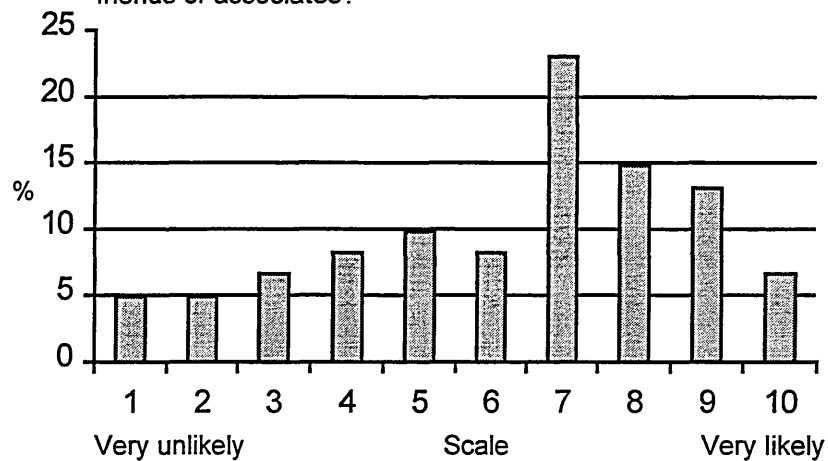
Yes	4.8%
No	19.4%
Did not answer this question	75.8%

Question 12) - How would you rate the way in which the complaint was handled?

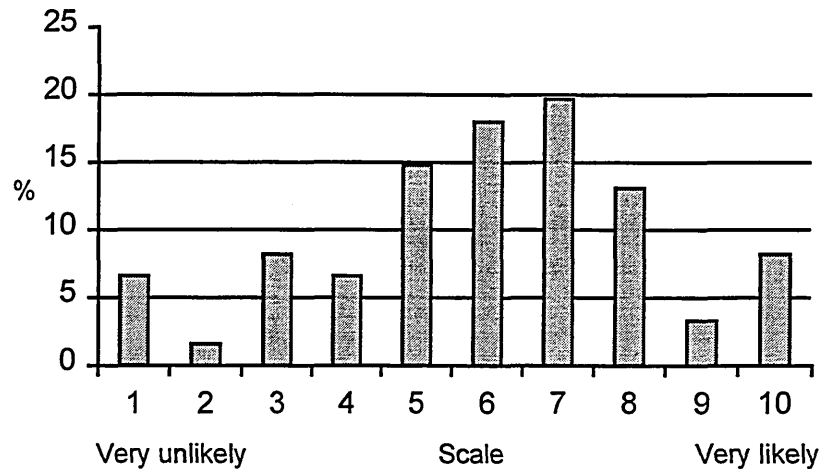
95.2% of respondents did not answer this question. For the three people that did, the graph can be seen below:



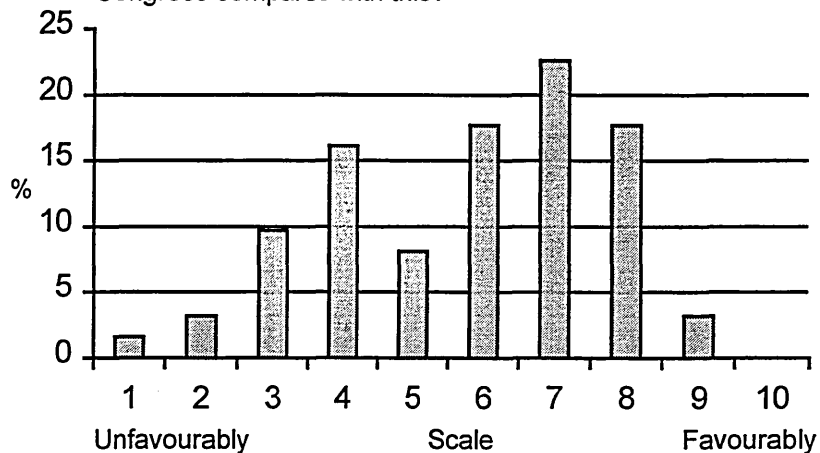
Question 13) - How likely is it that you would recommend this conference to personal friends or associates?



- Question 14)** - If you had to choose one TQM conference to attend, how likely is it that you would choose the World Congress at Sheffield?



- Question 15)** - If you can imagine an ideal conference, how well do you think the Congress compares with this?



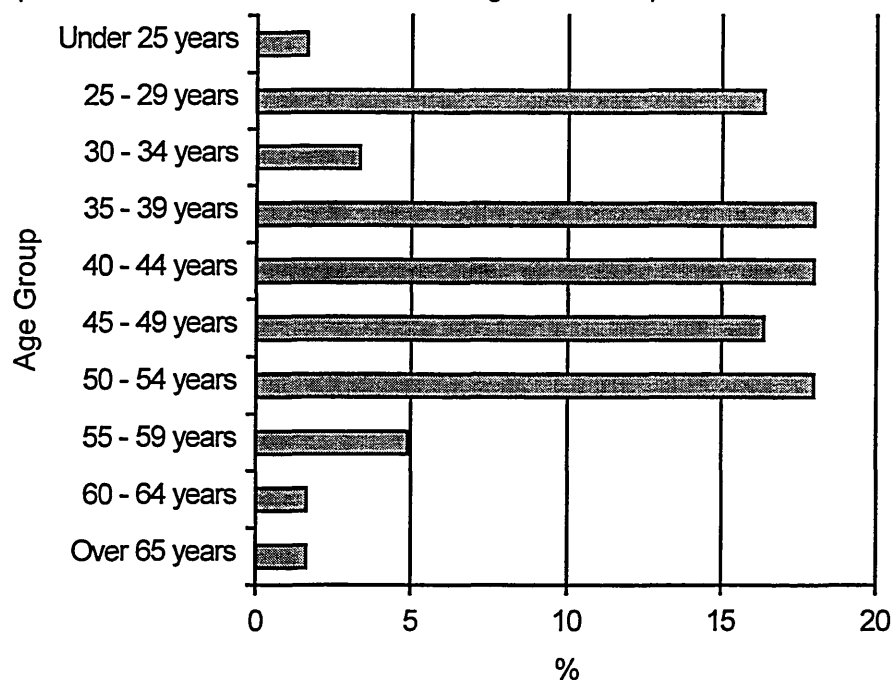
- Question 16)** - Are there any other areas or issues connected with the Congress that you would like to make further comment about?

A full list of comments can be seen in appendix 29.

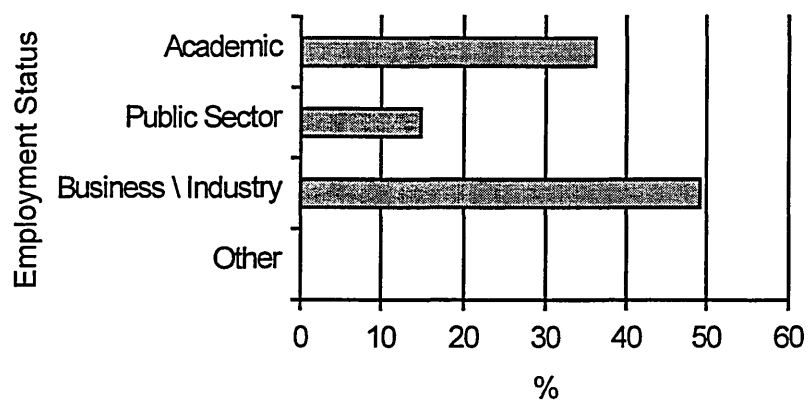
Personal Details

- In total 62 people returned the questionnaire (everyone who attended the conference received a copy of the questionnaire in their pack).
- 75.4% of the respondents indicated that they were male with the remaining 24.6% being female.

- The graph below shows the breakdown of the ages of the respondents:



- The graph below shows how the respondents classified their profession:



Appendix 28 - Comments from question 10) (TQM, 1999)

Comments have where possible been typed as written on the questionnaire. Spellings where possible have been corrected. Where underlines have been used '_____', these indicate a word that could not be read.

- 1) Speakers papers \ slides not all in proceedings book. 2) Why not available on CD-ROM?
- 3) No facilities for connecting laptops to external lines for people wanting to get some work done between sessions. 4) Too much chalk and talk - need more breakout sessions. 5) It was bad enough finding some sessions papers not available except at the actual sessions (if there were enough available), but what about copies of papers from elective sessions not attended and not in the publications (proceedings). 6) For a TQM conference the organisation left a lot to be desired. 7) Some questions on this survey are ambiguous and so open to interpretation that I doubt you can make meaningful conclusions from.
- There wasn't a list of delegates, key speakers etc. available from the beginning. It would be nice if you had PC workstations available for the delegates etc, to check e-mail.
- Car parking facilities very poor. Theme of conference needs to be communicated early. Some sectorisation of break out groups may be useful to encourage more business leaders and new faces.
- All plenary sessions (inc. session 1) MUST have papers in proceedings - Eventually arrived. Badly organised.
- Lack of delegate lists.
- Some syndicate rooms too far and noisy. Some presentations lacked focus ie innovation Tuesday.
- Even allowing for the low cost the standard of accommodation and service at Broomgrove hall was poor. I would never stay there again. No reception. People were not aware that we were arriving. Bedrooms were inadequate. Breakfast too late for departure bus. No facilities.
- Car parking. Lunch on opening day.
- Copies of presentation material should be contained in a folder. All material from all speakers and presentations and give to delegates on arrival first day.
- OHPs could sometimes not be seen clearly.
- Speakers often covered topics different from the papers without making this clear in most cases. Also many speakers failed to appear.
- About original setting of presentation equipment in seminar room.
- Food.
- No delegate list available.

- Noise of drilling in Geoff Carters session - but one of delegates sorted it out. List of delegates rather shabby and came late. Would be nice to have had a folder of session slides notes for all sessions, although I appreciate that you get the proceedings journal issue.

Appendix 29 - Comments from question 16) (TQM, 1999)

Comments have where possible been typed as written on the questionnaire. Spellings where possible have been corrected. Where underlines have been used '_____', these indicate a word that could not be read.

- Economic linked issues
- Too many academics looking backwards, need more forward thinking and contributions from industry. Have you thought about a variety of mechanisms to gather feedback? Eg. focus groups during the conference, website options for people to give reflective feedback after they've left.
- On arrival at the conference my colleague and I didn't appear to be on the delegate list, although we registered months before. This explains why we didn't receive a copy of the full, revised programme in recent weeks.
- A very enjoyable useful conference with a wide range of topics that can be of practical value to most organisations.
- The congress committee should consider more service industry elements in the programme, backed up with case studies.
- More practical cases \ examples \ methods. Low quality on many academic papers, little new. Mixed quality for plenary speakers from outstanding to little interest. Main focus on process management, knowledge management, development of strategy.
- A lot of mention of manufacturing and service businesses, what about specific software issues. These cross the spectrum of both as is manufactured (produced) and then supported (service). It is understood that all tools of TQM are generic but any specific examples of software would be useful, as would make course more tangible to people in the software industry.
- Perhaps it is time to change the 'brand' of the conference from TQM to eg Driving Excellence.
- Need to re-invent the congress. Same speakers every year / move to every other year. Have a feedback on the web, not the questionnaire. More workshops. More involvement. Less preaching. More learning. No displays in the book shop, they claim they were not told. No corporate displays - Why?
- Parallel sessions need better rooms with note taking facilities and proper blackout to facilitate powerpoint presentations. Pennine LT was very good. Parallel sessions would be better with only 3 speakers in 90 mins, include more sessions if necessary. Norfolk LT very poor. 3 days is too long, condense into 2 days. Therefore, less time, less cost, more delegates.

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- I would have preferred more practical sessions such as Richard Field's leadership and Geoff Carters knowledge management. Ie inductive as well as deductive learning.
 - Selling to business community hard, but, make it more relevant. Most of what was discussed is known or used in the business environment.
 - Should be a list of contributors people at conference. Contact addresses for speakers.
 - Timing was an issue throughout. The days with most sessions I attended leaving no time for Q \ A as planned. This left me feeling uninvolved and frustrated.
 - Workshops and debates were very interesting and informative. There should be more of them.
 - The conference appears to have a conflict of identity - is it academic and the chance for research to be reviewed or for business addressing the practicalities of applying Business Excellence issues. It seems to tend to the former whilst hinting at the latter. To improve is, more practical sessions (workshops) should be added, with greater clarity regarding the content of topics. Titles alone can be and were very misleading.
 - More relevance to public service issues. Tended to be top heavy with business figures mentality.
 - The lack of Japanese experiences and the small amount of American ones were notable. Perhaps the name should change to European Congress for TQM. It would avoid expectations.
 - Despite feedback \ analysis from last year event - Academic presentations still predominate (67% of all workshop sessions only 21% were from industry / business). Against this background it is hard to believe any effective 'improvement action' was taken to respond to last years satisfaction survey. Why wasn't the improvement plan presented as part of Session 3c. This is the main reason for the low probability of my returning next year. PS I missed the momento of Sheffield freebie!
 - Would like to hear more about CMN (not just BEM). Would prefer more speakers from business \ industry, particularly small enterprises. Opening speech should indicate what doing differently as a result of last years survey. Free bag was a nice idea but would have saved confusion if had a name tag facility. Conference should be more widely advertised to widen the audience. I saw advert in 'Quality World'. Not all Quality Managers get this. Also advert could outline likely topics to be covered. Very sad that process improvement talk was scrapped.
 - Seems to fall between two schools. Neither academic nor sufficient business / practically focused. I feel that it should focus more clearly in developments and _____ of practice (problems as well as successes).
 - One advantage of attending a congress is to make contact with other delegates with similar interests. Hence a full attendance list should be available at the time of registration. Choose different places for the gala dinner. Same place becomes monotonous.
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- Many of the papers are excellent, but there is noticeable repetition eg _____ Tribus' paper is the same as his talk last year.
- TQM covers a huge range of different definitions. Some of the bass for the different models are poles apart ie Belief in motivation, incentives, performance appraisals. Your conference links them all together. The psychological aspects, exploration further of the 'Cultural Aspects' merit particular discussion and analysis, more then you allow them now. They are crucial to success.
- The balance of speakers was too heavily in favour of academics (+70%). More business practitioners required.
- Quality of speakers varied from excellent to the worst I have ever heard. Other concerns, documentation was not available to support several of the presentations. The conference appears to be increasingly academic, less business focused. Limited opportunities for networking. Breakout rooms uncomfortable, hot, drilling noise during session 4a.
- Decide is it academic audience you're appealing to or business fraternity? If both then market the conference appropriately and word the first flyer people receive with clear labels and sessions descriptions as to whether its THEORY or PRACTICE.
- A counter to sell books at a discount. A small souvenir for all participants. Information for relevant conferences. Powerpoint for keynote speeches. Handout.

Appendix 30 - Tables and Figures pertaining to Chapter 9

Table 1 - Comparison of the different data sets (ACSI Model)

Data Set	Latent Variable Index Scores					
	Expectations	Perceived Quality	Perceived Value	Customer Satisfaction	Complaints	Loyalty
SYP, 1997	58.8	73.9	55.8	66.4	82.0	47.8
SYP, 1998 Part 12	65.4	72.9	55.1	58.9	79.7	71.4
SYP, 1998 Part 3	57.9	69.3	52.8	54.1	84.3	51.5
YPO, 1997	76.0	81.7	75.5	75.0	70.8	74.8
TQM, 1998	69.7	72.3	69.1	62.8	83.3	59.1
TQM, 1999	69.7	64.8	62.3	56.3	73.6	57.4

Figure 1 - Customer satisfaction index scores (ACSI Model)

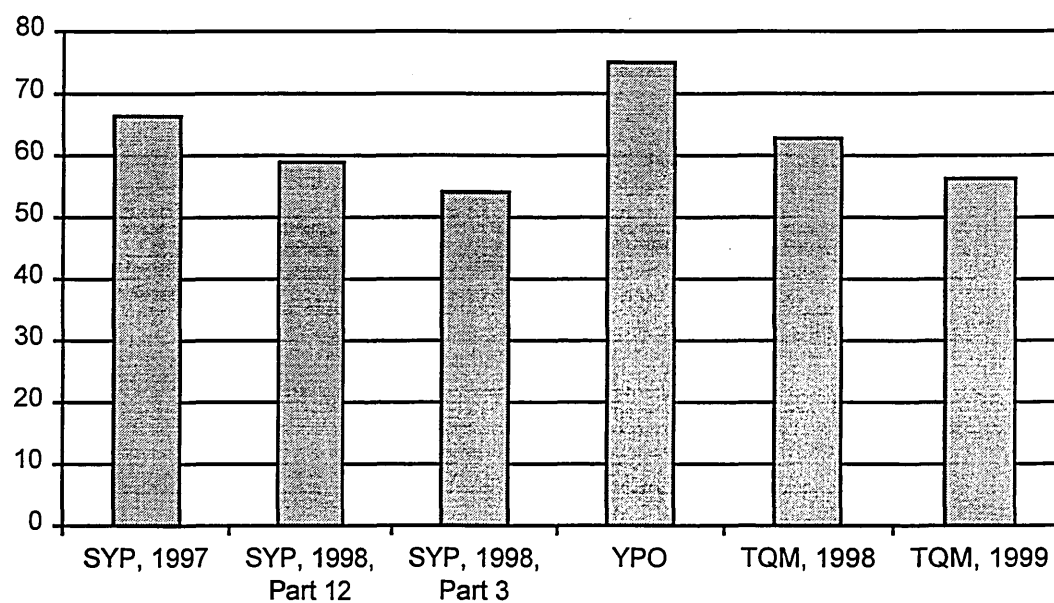


Table 2 - Comparison of the different data sets (ECSI Model)

Data Set	Latent Variable Index Scores						
	Expectations	Soft Quality	Hard Quality	Image	Perceived Value	Customer Satisfaction	Loyalty
SYP, 1997	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SYP, 1998 Part 12	65.2	72.9		73.0	55.1	58.7	71.4
SYP, 1998 Part 3	58.2	67.8		63.2	52.8	53.3	51.6
YPO, 1997	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TQM, 1998	69.4	64.4	77.7	68.8	69.1	63.5	59.1
TQM, 1999	69.4	59.1	76.8	64.2	63.3	56.1	57.5

Figure 2 - Customer satisfaction index scores (ECSI Model)
